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COMMISSION ON BUILDING DISTRICTS AND RESTRICTIONS

FINAL REPORT

JUNE 2, 1916

CITY OF NEW YORK
BOARD OF ESTIMATE AND APPORTIONMENT
COMMITTEE ON THE CITY PLAN
1916

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THE TALL AND STILL TALLER BUILDINGS OF LOWER MANHATTAN.

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CHAPTER I—INTRODUCTION

June 2, 1916.

To the Board of Estimate and Apportionment:

On May 22, 1914, the Board of Estimate and Apportionment adopted the following resolution:

> "Whereas, Chapter 470 of the Laws of 1914, approved by the Governor April 20, 1914, authorizes the Board of Estimate and Apportionment to divide the City into districts and to regulate the height of buildings, the area of courts and open spaces, the location of trades and industries and the erection of buildings designed for specified uses; and
>
> "Whereas, The statute provides that before establishing such districts and adopting such regulations the said Board shall appoint a commission 'to recommend the boundaries of districts and appropriate regulations to be enforced therein'; therefore be it
>
> "Resolved, That the Board of Estimate and Apportionment appoint a Commission on Building Districts and Restrictions of not less than nine, nor more than nineteen members, serving without pay, if not already in the employment of the City, to recommend the boundaries of districts and appropriate regulations to be enforced therein; and
>
> "Resolved, That the Committee on the City Plan of the Board of Estimate and Apportionment, the chief engineer of the Board, the presidents of the various boroughs and the various city departments be requested to advise with the Commission, and to co-operate actively with it in the preparation and study of the necessary data; and
>
> "Resolved, That the secretary of the Committee on the City Plan shall serve also as secretary of the Commission; and
>
> "Resolved, That before reporting its recommendations the Commission shall hold public hearings thereon."

On June 26, 1914, the present Commission on Building Districts and Restrictions was appointed pursuant to the above resolution.

The work of the Districting Commission was preceded by the investigations and report of the Heights of Buildings Commission. On February 27, 1913, the Board of Estimate adopted the following resolution:

> "Whereas, There is a growing sentiment in the community to the effect that the time has come when effort should be made to regulate the height, size and arrangement of buildings erected within the limits of the City of New York; in order to arrest the seriously increasing evil of the shutting off of light and air from other build-

ings and from the public streets, to prevent unwholesome and dangerous congestion both in living conditions and in street and transit traffic and to reduce the hazards of fire and peril to life; and

"Whereas, Under the provisions of Section 407 of the Charter, the height and size of buildings may be regulated by city ordinance, but such ordinance must first have the approval of the Board of Estimate and Apportionment; therefore be it

"Resolved, That the chairman be authorized to appoint a committee of three members of the Board of Estimate and Apportionment to take this general subject under consideration, to inquire into and investigate conditions actually existing, and to ascertain and report whether, in their judgment, it is desirable to regulate the height, size and arrangement of buildings hereafter to be erected or altered within the city limits, with due regard to their location, character or uses, to examine into the practice and the comparative experience of other cities either here or abroad, and to consider and report upon the question of the legal right of the City of New York to regulate building construction in the manner proposed; and be it further

"Resolved, That such Committee may also investigate and report whether, in their judgment, it would be lawful and desirable for the purposes of such regulation to divide the City into districts or into zones, and to prescribe the regulation of the height, size and arrangement of buildings upon different bases in such different districts or zones; and be it further

"Resolved, That the Committee, when appointed, may in turn appoint an advisory commission to aid in its work, such commission to consist of as many members as the Committee may determine, serving without pay, if not already in the employment of the City, but including representatives of each of the several boroughs, and that either the Committee or its advisory commission may hold public hearings in each of the boroughs and may use all appropriate means to bring the subject to the attention of the taxpayers and to other persons who may be interested; and be it further

"Resolved, That the Committee be empowered to employ a secretary, who shall also be the secretary of the advisory commission, to secure such expert or technical advice as it may require for its proper guidance, and to incur such other incidental expenses as it may from time to time find necessary, such disbursements to be made from the contingent fund of this Board, but not to exceed in the aggregate the sum of $15,000; and be it further

"Resolved, That the said Committee be instructed to submit, if practicable, in advance of any general report that it may make, suggestions and recommendations with relation to the proposed limitation of the height of buildings upon Fifth avenue, between One Hundred and Tenth street and Washington Square, in the Borough of Man-

hattan, and within certain prescribed areas on either side of the said avenue, as proposed in the resolution presented to this Board on May 9, 1912, and now pending; and be it further

"Resolved, That such Committee shall submit its final report and recommendations to the Board not later than six months from the date of its appointment, and shall thereupon cease to exist."

In accordance with this resolution the Mayor appointed a Heights of Buildings Committee with George McAneny, President of the Borough of Manhattan, as Chairman. This Committee appointed an Advisory Commission consisting of the following members: Edward M. Bassett, Chairman; Edward C. Blum, Edward W. Brown, William H. Chesebrough, William A. Cokeley, Otto M. Eidlitz, Abram I. Elkus, Burt L. Fenner, J. Monroe Hewlett, Robert W. Higbie, C. Grant La Farge, Nelson P. Lewis, George T. Mortimer, Lawson Purdy, Allan Robinson, August F. Schwarzler, Franklin S. Tomlin, Lawrence Veiller and Gaylord S. White.

On December 23, 1913, this Advisory Commission submitted its report. The Commission, through its technical staff, made extensive investigations, both of existing conditions in New York City and of the practice and experience of other cities, both domestic and foreign, including an intensive study of the zone regulations of German cities. The Commission held an extended series of hearings and of conferences with leading experts and others representing the civic, social, professional, business and real estate interests of the entire city. The Commission's report of 295 pages contains a thoroughgoing and authoritative discussion of the problem of regulating the height, area and use of buildings. The Commission states that it finds conclusive evidence of the need of greater control over building development. "The present almost unrestricted power to build to any height, over any proportion of the lot, for any desired use and in any part of the city, has resulted in injury to real estate and business interests, and to the health, safety and general welfare of the city." The Commission found that any complete system of building control necessitated the application of different regulations to different parts of the city and accordingly recommended that the city be divided into districts and that the restrictions for each district be worked out with reference to the peculiar needs and requirements of that particular district.

The resolution under which the Heights of Buildings Commission was appointed directed it to investigate and report on whether in its judgment a districting plan would be lawful. The Commission gave much attention to this problem and considered carefully the various laws and decisions bearing on the subject. As a result of such consideration the Commission gave as its mature opinion that reasonable and appropriate regulations for the districting of the city are constitutional under the general police powers of the State. The Commission submitted a draft charter amendment permitting the Board of Estimate and Apportionment to divide the city into districts for the purpose of regulating the heights of buildings, the area of

courts and open spaces, the location of trades and industries and the location of buildings designed for specified uses. This draft amendment was passed by the Legislature, approved by the Governor and became a law April 20, 1914. (See Appendix I.) Pursuant thereto the present Districting Commission was appointed.

Taking up the work where the former Heights of Buildings Commission left it and using its data, investigations and report, the Commission has during the past two years made an exhaustive study of the entire subject. The Committee on the City Plan of the Board of Estimate placed at the disposal of the Commission its expert staff. The Commission has made an extensive study of the present distribution of population and of the present and proposed transit facilities, including a detailed transit time zone map showing the estimated time from 14th Street, Manhattan, to every section of the city, under the new dual subway system. Maps have also been prepared showing the distribution of factory employees in the places in which they work throughout the city; also maps showing graphically and in detail the assessed land values per front foot throughout the city. With the aid of insurance and real estate atlases, maps have been prepared for each borough showing at various periods in their history the transit lines and the building development and its use for residential, business and industrial purposes. The present building development has been most carefully studied and maps have been prepared to show graphically and in detail the height of each building and the percentage of the lot covered by it. Maps were also prepared showing existing grades, contours and other topographical features. The entire area has also been studied in detail and on the ground by members of the Commission and its staff of experts.

The Charter amendment under which the Commission is acting directs it before submitting a final report to the Board of Estimate to make a tentative report and hold public hearings thereon at such times and places as the Board shall require. Accordingly on March 10, 1916, the Commission submitted to the Board a tentative report and the Board fixed as dates for public hearings March 27th, 28th, 29th and 30th, and April 3d, 4th, 5th, 6th, 10th, 11th, 12th, 13th, 17th and 18th. In addition to the hearings above specified, adjourned hearings have been held as follows: April 20th, May 4th, 8th, 9th, 10th, 11th, 15th, 18th, 22d, 24th, 25th and 31st.

The tentative report included a brief discussion of the general principles involved in the proposed plan and a draft resolution with accompanying maps embodying the plan in detail. The tentative report and maps were printed and distributed widely among interested individuals and associations. Many of the maps were also printed by various newspapers. A stenographic record was taken of the public hearings. The general opinion expressed was overwhelmingly in favor of the general plan outlined. Not a single organization and only two or three individuals expressed dissent from the general principle involved. Many individuals and associations testified strongly to the urgent necessity for the adoption of the plan pro-

posed. Many asked for detailed modifications of the plan. Most of these were for the application of more restrictive regulations. A few associations and individuals, while heartily commending the plan, urged that, especially as to limitation of height and area covered, the plan be made more stringent. Leading experts in various lines appeared and urged the supreme need for the adoption of the proposed comprehensive plan in the interest of public health, safety and general welfare. Subsequent to the hearings, the Commission considered carefully the various suggestions and protests made to it at the hearings and through written or oral communication. As a result of such reconsideration it has made numerous changes in detail in its proposed plan. The general plan and the principles underlying it have not been materially changed. The revised plan is herewith submitted as the final report of the Commission.

CHAPTER II—NECESSITY FOR A COMPREHENSIVE PLAN OF CITY BUILDING

City planning is a prime need of our city. It is plain common sense to have a plan before starting to build. City building is no exception to the rule. Haphazard city building without a comprehensive plan is ruinous.

The bigger a city grows the more essential a plan becomes. Traffic problems, the congestion of population, the intensive use of land, the magnitude of the property values involved, make the control of building development more and more essential to the health, comfort and welfare of the city and its inhabitants. New York City has reached a point beyond which continued unplanned growth cannot take place without inviting social and economic disaster. It is too big a city, the social and economic interests involved are too great to permit the continuance of the *laissez faire* methods of earlier days.

As has been stated by the Committee on the City Plan of the Board of Estimate:[1] "With or without a comprehensive city plan, the city will probably spend hundreds of millions of dollars on public improvements during the next thirty years. In addition, during this same period, property owners will spend some billions of dollars in the improvement of their holdings. To lay down the general lines of city development so that these expenditures when made will in the greatest possible measure contribute to the solid and permanent upbuilding of a great and ever greater city—strong commercially, industrially and in the comfort and health of its people—furnishes the opportunity and the inspiration for city planning."

While city planning includes the street and block layout, park and recreation system, location of public buildings, sewerage system, water supply, transit and transportation systems, and port and terminal facilities, these constitute but half the problem. The way in which private property, which occupies almost two-thirds of the entire area, is developed is of at least equal importance. No plan for the development of public facilities can be complete and effective unless there goes with it a comprehensive plan for the control of building development on private property.

A street layout planned for a five-story city may be wholly inadequate for a ten-story city. Street capacity adapted to the convenient movement of traffic of all kinds is of supreme importance to the prosperity of the city. Street congestion means loss of economic efficiency and is a menace to public safety and order. We cannot hope to plan an adequate street system unless some limit is placed on the height and character of the buildings that the street system is to serve.

A street and block system that is best suited to a residence section may be entirely unsuited to the needs of a commercial or industrial section. Certain types of industries are best served by large block units and broad

[1] Development and Present Status of City Planning in New York City, 1914, p. 12.

streets. Certain residential sections are best served by shallow blocks and comparatively narrow streets. Without a plan of building control that will segregate the industrial from the residential sections, it is impossible to plan a street and block system that will be suited to the requirements of the various sections and to the uses that it is intended to serve. New York City has suffered serious economic and social loss because its street and block system built up on a distressingly standardized plan has not been adapted to the particular requirements of certain types of industrial, business and residential use. With the existing uncontrolled and haphazard building development a uniform street and block system was the only one that the city could properly adopt.

Nelson P. Lewis, Chief Engineer of the Board of Estimate and a leading expert on municipal engineering and city planning, testified to the need of the segregation of industrial districts from the point of view of improved traffic conditions, a convenient street layout and economic advantage. He said: "This city has suffered tremendous losses by the inflexibility of its street system, which instead of controlling a subdivision has been controlled by the habit of creating lots one hundred feet deep, lying between streets two hundred feet apart, and great enterprises, a number of which were formerly located in the Erie Basin section of Brooklyn, finding themselves hemmed in by rigid street systems to which more or less sanctity was attributed, have been obliged to find new sites on the New Jersey meadows. One conspicuous instance of this is the Worthington Pump Works."

The City's park system is valued at $673,000,000. Large additions to this system will be needed to provide for the requirements of Brooklyn, Queens and Richmond. Unless a park system can be located with reference to the particular residential sections that it is intended to serve, its value is greatly impaired. Various small parks and parkways have been located in what have now become factory sections. A comprehensive plan of building control would have made it possible to have so located these parks that their contribution to the public health, comfort and welfare would have been vastly greater.

The adequacy of the City's future sewerage system is also in large measure dependent on the adoption of a plan of building segregation and height limitation. The city recognizes that in order to prevent intolerable pollution of the waters of the harbor it must adopt plans for sewage treatment. Segregation of factories will facilitate the problem of sewage treatment by making it possible to confine the special facilities required for the treatment of certain trade wastes to certain factory districts. While the height of buildings has comparatively little effect on the adequacy of a combined system of sewerage, storm water and sanitary, it is of the very greatest importance where a separate sanitary system is used. Manhattan is undertaking in large measure a reconstruction of its sewerage system and, in view of the necessity for the early adoption of sewage treatment,

will reconstruct its sewers on the separate system. The other boroughs, for the same reason, will probably adopt in large measure the separate system. Amos L. Schaeffer, Consulting Engineer, Borough of Manhattan, an expert on sewers, testified that the adoption of the Commission's plan of building control will be of great assistance in planning the future sewerage system of the city.

The city is spending an enormous amount of money to extend and improve its rapid transit facilities. This expense was undertaken largely for the purpose of preventing the present indecent, unsafe and unsanitary congestion on the transit lines and for preventing the further congestion of population. New lines were needed, but they alone will be wholly ineffective in preventing the continuance and increase of intolerable congestion during the rush hours on all the rapid transit lines—the new as well as the old. This rush hour congestion problem is the inevitable result of centering all business and industry between the Battery and 59th Street. If everyone must come to Manhattan to work it will be quite impossible to provide adequate transit facilities during the rush hours. The remedy lies in creating numerous other business and industrial centers and checking the extension of the Manhattan areas devoted to business and industry, especially the latter, combined also with a limitation on the intensity of building development in such areas. This corrective the districting plan is designed to furnish. Daniel L. Turner, Deputy Engineer of Subway Construction of the Public Service Commission, a leading expert on city passenger transportation, has testified to the absolute necessity of adopting such a plan for the purposes above mentioned. Mr. Turner said: "Unless a very careful housing and districting regulation, such as you are trying to carry out here is adopted, it will be absolutely impossible for the city to cope with its municipal transportation problem. These two problems have got to be taken together. They are absolutely related to each other. We can provide facilities up to a maximum of the street capacity, but we are rapidly coming to the actual capacity of the streets, so that the housing ought to be so controlled and the manufacturing sites and the working sites, with a view to having the population distributed over the whole area and in that way develop a two-way business on all lines to the very utmost."

With increasing population and attendant congestion it becomes more and more important and difficult to guard the public health. A districting plan to the extent that it reduces congestion and attendant close personal contact on the transit lines and on stairs and elevators, will prevent the transmission of communicable disease. Dr. Haven Emerson, Commissioner of Health, testified to the menace of the rush-hour congestion and the importance to public health of the proposed districting plan, as follows: "Another point in which health authorities foresee benefit to public health by a consistent plan for the control of the future growth of the city is in the improved conditions of occupancy of traffic conveyances. It is appreciated and acknowledged that the more congested is a traffic conveyance the

more dangerous does it become as a means of transmitting communicable disease to others, and there is a constant proportionate increase in infectious organisms found in the air of traffic conveyances as their congestion increases. Observations made in the subway from the Atlantic Avenue Station to 96th Street and back through the subway during the rush hours have shown a constant increase of the disease breeding organisms such as were responsible for the epidemic of infectious colds during last December, January and February. Observations show the presence of these bacteria in such amounts as to constitute a serious public menace. The epidemic cost the city two thousand lives over and above the usual death rate as it prevailed a year ago and for the previous five years. Those deaths were due to organisms which were found constantly in the air in the subway cars, which has been examined in our laboratory."

The importance of the districting plan to the public health as related to provision of light and air is immediate and undoubted. Adequate natural light and air are admitted to be fundamental in health regulation. Much of the entire districting plan is based on the desire to secure for the public as wholesome conditions with regard to provision of light and air as are compatible with the necessary and reasonable utilization of the land. Only through a comprehensive plan for the districting of the city is it possible to apply adequate and effective standards of light and air in the interest of the public health. This is confirmed by the testimony of Dr. Emerson, who says: "I would say that the opinions of physicians have been expressed in reports which are almost identically worded, dating back at least one hundred years, with exactly the same conclusions and recommendations which might be considered parallel with those now arrived at by this Commission; also that the report of 1832 and previous ones of citizens' committees on conditions of health in this city indicated the necessity of providing for the future. These recommendations were made when the development of New York City had not yet reached 14th Street. We are still without the necessary relief, which nothing but this plan of yours can provide."

Sunlight destroys disease breeding bacteria. Artificial light as ordinarily used has virtually no effect upon bacteria. This sanitary effect of sunlight is sufficient reason for its requirement in liberal amount wherever people live and work. Natural light also has undoubted superiority from the standpoint of general health and efficiency of the workers. The use of artificial light results in an increase of eye-strain and reduced physical resistance to disease. Good air conditions are usually possible where there is good natural light; poor ventilation is a usual accompaniment of the dark room. This is borne out by Dr. Emerson in his testimony before the Commission: "It is proved that sunlight in the living room and the sleeping room materially aids in providing resistance against diseases like tuberculosis. The sun has a destructive effect upon disease breeding bacteria. Direct sunlight is a most effective disinfectant. Direct daylight—even

though not direct sunlight, has a powerful influence in destroying pathogenic bacteria. In addition to that, people who are able to live in well-lighted apartments have a physical resistance which is superior to that of people who live in dark rooms. That has been proved under exact experimental conditions in laboratory tests and is a matter of common observation among human beings." In the same connection Dr. Emerson said: "Diminished resistance of humans, as with vegetation, depends upon the artificiality of their environment. You cannot raise babies without light and air any more than you can raise plants, and where you cannot prove that a disease has followed congestion, you can almost always show diminished resistance."

Health is sometimes regarded as merely the absence of disease, but as has been pointed out by George C. Whipple, Professor of Sanitary Engineering, Harvard University, in a memorandum submitted to the Commission, that is not a complete conception of health. "Health is more than the absence of disease. It is something positive, and involves physique and vitality and it is mental as well as physical. The inherent difficulty at the present time is the absence of scientific methods of measuring this positive element in health. Yet the world knows as a matter of human experience that it is real and vital. The expression 'health and comfort of the people' is centuries old, and these two ideas are inseparable." Health as a positive concept denoting physical and mental well-being will be promoted in many ways by the districting plan. The public health is the sum total of the health of the constituent individuals. Well ordered city development cannot fail to have a marked effect on the physical fitness and vitality of the city's inhabitants.

Dr. Gustav F. Boehme, Jr., neurologist, testified to the rapid increase in nervous disorders and troubles and to the very direct relation between such increase and the present high buildings and haphazard development and the congestion, noise and confusion incident thereto. The necessity for reducing the stress and strain of city life is becoming more and more apparent. This is essential if the city is to be a place in which our heritage of health and vitality is to be used, conserved and handed down to succeeding generations instead of being abused and exhausted.

Congestion of traffic and population and haphazard building make the city's fire fighting problem increasingly serious. It becomes increasingly difficult to move fire apparatus through the congested streets. Streets densely packed with crowds of people that quickly form wherever a fire occurs, interfere with prompt service after the scene of the fire is reached. If a serious fire should break out in lower Manhattan coincident with an explosion or earthquake shock that would cause a general panic and outpouring into the streets, it might be utterly impossible for the firemen to reach the fire and a terrible conflagration might result. This is the plain truth and it is foolhardy to utterly ignore it and go on piling up buildings and further extending the danger zone. The districting plan will, as to

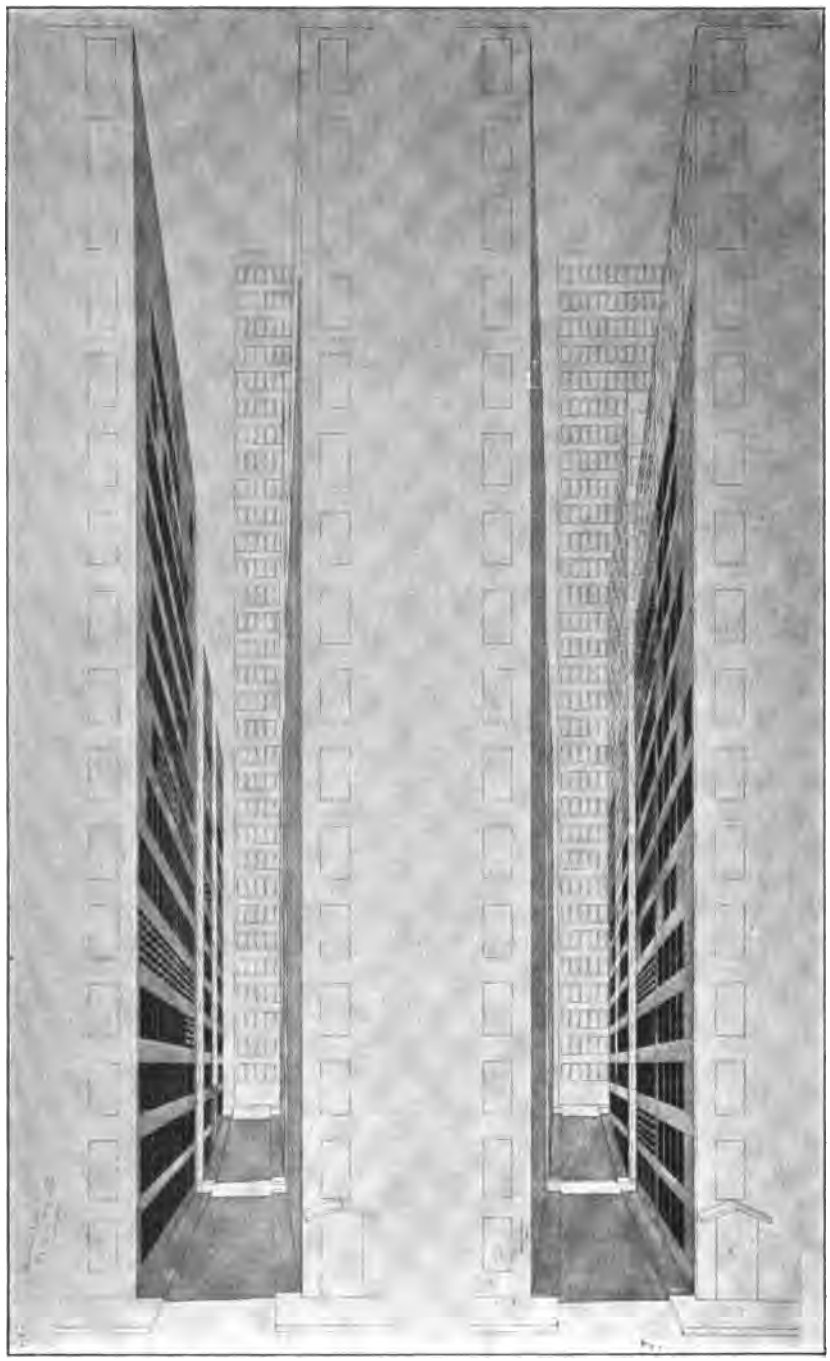
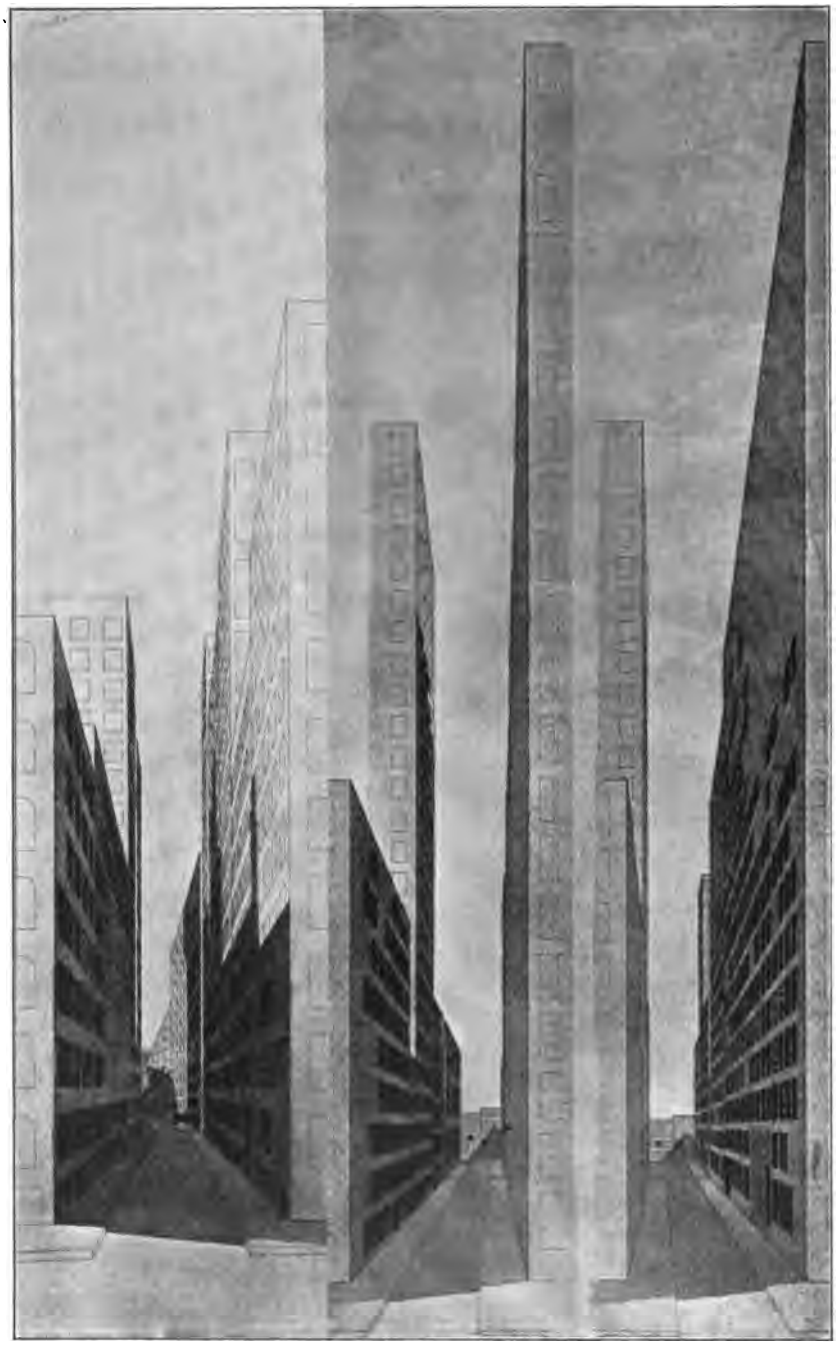


FIG. 2—USE OF ARTIFICIAL LIGHT IN OFFICES ON EXCHANGE PLACE, FROM BROAD STREET TO BROADWAY.

The black windows indicate where artificial light was being used near the windows at noon on a sunny day.



(A) (B)

FIG. 3—USE OF ARTIFICIAL LIGHT IN OFFICES: (A) ON NEW STREET, LOOKING SOUTH FROM WALL STREET; (B) ON EXCHANGE PLACE, FROM BROAD STREET WEST.

The black windows indicate where artificial light was being used near the windows at noon on a sunny summer day.

future growth, tend to spread out business and industry, both by limiting the height of buildings and by encouraging the development of commercial and industrial areas in the other boroughs. In this connection, John Kenlon, Chief of the Fire Department, said in his testimony before the Commission: "In the thirty years that I have been connected with the Fire Department, lower Manhattan has changed from a five-story city to a twenty-five-story city. There is great congestion there at the present time; during the day time it is difficult to move apparatus in response to fire calls in the lower end of Manhattan Island. Increased congestion of people and traffic in this section will cause very serious delays in getting apparatus to work around the scene of a fire. Even at present it is very difficult until the police reserves arrive and establish fire lines at a safe distance from the scene of the fire. The same condition prevails in the uptown section from 23d Street to 45th Street, particularly at certain hours. The men who laid out the old part of the city 250 years ago had very little conception of the conditions that obtain to-day. Those gentlemen could not possibly see the great 10-ton and 15-ton motor trucks running around on our streets. Downtown to-day it is almost impossible to get through the streets; in ten years from now horses will be a very rare sight on the streets of New York. The small buggy has been superseded by the Packard, which takes four times the space. The streets are too narrow in the lower part of Manhattan to take care of the traffic. It is a serious matter, it requires a great deal of experience, a good hand and strong arm to drive fire apparatus through the streets of lower Manhattan. Any plan that will in a measure prevent the increase of congestion in the central portions of the city is a plan in the right direction."

The segregation of residential, business and industrial buildings will also make it easier to provide the fire apparatus in each section suitable for the character and intensity of development in that section. It will make it easier to provide proper safeguards against fire. It will increase the safety and security of the homes of the people. These facts were testified to by Chief Kenlon of the Fire Department and by Edward R. Hardy, Assistant Manager, New York Fire Insurance Exchange.

Segregation as to use and limitation of height are also essential to the prevention of street accidents. The injury to life and limb from street accidents is enormous and is constantly increasing. In 1915 there were 18,139 vehicular accidents in the streets of New York City. Of these 608 proved fatal. An orderly plan of building development will reduce such accidents. Street accidents and street congestion are directly related. In so far as the districting plan will tend to reduce congestion it will reduce street accidents. There is also a direct relation between the number of different kinds of traffic using the same street, with its resulting confusion, and the number of street accidents. The segregation of uses with its resultant segregation of kinds of traffic will have a direct tendency to reduce street accidents. In the residential sections the number of accidents to

children while playing in the streets is very large. By preventing stores, garages and factories from locating on the residence streets the vehicular traffic on such streets is reduced and as a direct result the number of accidents to children. Of the persons killed by being struck by vehicles in 1915 over half were children.

Ernest P. Goodrich, consulting engineer and city planning expert, testified to the importance of the proposed plan in effecting a segregation of kinds of traffic and thus reducing street accidents. Edmund Dwight, resident manager of the Employers Liability and Assurance Corporation of London, stated his experience as follows: "My experience has indicated that accidents increase as congestion increases, and any plan which will reduce congestion of population in buildings or in areas of the city will reduce the number of accidents. The proposed limitation of heights of buildings will reduce congestion in elevators, which is one of the prolific causes of elevator accidents. Elevator accidents are due in far larger proportion to crowding and to carelessness on the part of passengers, and to unskillful handling, which is itself frequently caused by crowded cars, than to defects in mechanical appliances. The number of street accidents also, in large measure follow increase in density of population and it is strikingly the case that the proximity of manufacturing operations to crowded residential districts constitutes a peril, because heavy trucking, express and similar traffic has to be conducted through streets which are crowded with children. There is no question in my mind that limitation of building heights and districting for classes of use, so that manufacturing operations would be carried on in zones, with a minimum residential use, would each tend, in large measure, to the reduction of accidents and to the safety, as well as to the health of the people of New York."

Heretofore we have attacked the problems of public health and safety as related to building development in a piecemeal way. Special regulations have from time to time been provided with relation to tenement houses, factories, garages, theatres and other classes of buildings. Such regulations are often rendered wholly or partially ineffective by failure to control the environment of the building. The Tenement House Law provides for minimum size yards and outer courts which really depend for their adequacy on their being supplemented by similar yards and courts on adjoining lots. If, however, a towering loft building or warehouse is built next to a tenement, the standards of light and air aimed at in the Tenement House Law are impaired. The districting plan makes it possible to provide suitable and reasonable regulations for each class of buildings and at the same time preserve the advantage of substantially uniform regulations as to building height and yard depth for all structures within the block.

Every city becomes divided into more or less clearly defined districts of different occupation use and type of building construction. We have the central office and financial district, loft districts, waterfront and indus-

119 Ridge Street.

Roof is that of tenement on front of lot. Factory is in what should be the yard of tenement.

Suffolk Street, Between Stanton and Houston Streets—Loft building extends to within a few feet of rear lot line.

Monterey Avenue, Near 178th Street —Rear wall of plumbing establishment is erected on rear line of yards of Third Avenue tenements.

FIG. 4—FACTORY BUILDINGS CUTTING OFF LIGHT AND AIR FROM TENEMENTS.

Aside from their noise, dust and odor, factory or loft buildings are detrimental to nearby tenements and private dwellings in their obstruction of light and air. Tenements are compelled to leave a yard in the rear of the lot, but loft and factory buildings are not prevented from erecting a high wall upon the lot line opposite tenement windows.

trial districts, retail business districts, apartment house and hotel districts, tenement house districts, private dwelling districts. Generally speaking, a building is appropriately located when it is in a section surrounded by buildings of similar type and use. Strong social and economic forces work toward a natural segregation of buildings according to type and use. In general, the maximum land values and the maximum rentals are obtained where this segregation and uniformity are most complete. One purpose of districting regulations is to strengthen and supplement the natural trend toward segregation.

In spite of the natural trend toward segregation, building development in many parts of the city is haphazard. The natural trend toward segregation and uniformity is not strong enough to prevent the sporadic invasion of a district by harmful or inappropriate buildings or uses. Once a district has been thus invaded, rents and property values decline, loans are called and it is difficult ever to reclaim the district to its more appropriate use. Individual property owners are helpless to prevent the depreciation of their property. The districting plan will do for the individual owners what they cannot do for themselves—set up uniform restrictions that will protect each against his neighbor and thus be of benefit to all.

While in New York City economic forces tend to the segregation of industries of the heavier type along the water and rail terminals, and to the segregation of certain light industries near the wholesale, retail, hotel and passenger terminal center in Manhattan, there are many kinds of light industry that are free from any segregating force and locate indiscriminately throughout the city. They are found scattered throughout the business and residential sections, especially the residential sections, from which their labor supply is recruited. The factory is usually a blight within a residential section. It destroys the comfort, quiet and convenience of home life. There is nothing more vital to the city than the housing of its people. The exclusion of trade and industries from the residential streets is essential to wholesome and comfortable housing. Stores, garages and other business buildings scattered among the residences are a constant menace to residence property. The concentration of all the neighborhood business buildings on the business streets makes the transaction of business more convenient. The segregation of dwellings on the exclusively residential streets adds to the convenience, quiet and amenities of home life, and thus tends to increase property values on such streets.

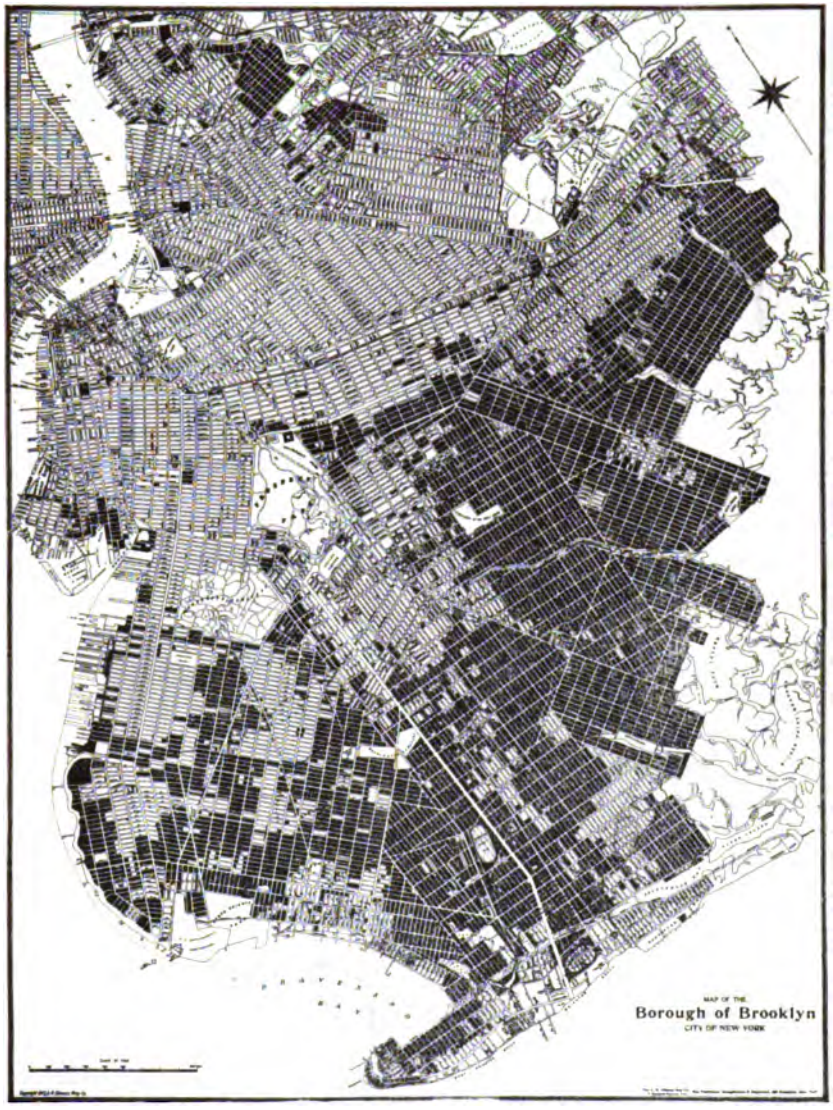
In New York City the purely private injury incident to haphazard development has become so serious and widespread as to constitute a great public calamity. Through haphazard construction and invasion by inappropriate uses the capital values of large areas have been greatly impaired. This destruction of capital value, not only in the central commercial and industrial section of Manhattan, but also throughout the residential sections of the five boroughs, has reached huge proportions. It does not stop with the owners in the areas immediately affected, but is reflected in depressed

values throughout the city. Market value for investment purposes is always affected by the hazard of the business. Economic depreciation due to unregulated construction and invasion by inappropriate uses has become a hazard that must be considered by every investor in real estate. This extra hazard increases the net earning basis required to induce investment, and consequently lessens capital values throughout the city. Whatever the capitalized amount that may be properly charged to the economic depreciation hazard, it is certainly a huge burden and one that affects not only the individual owners of real estate throughout the city but the savings and other large lending institutions, the municipal finances and the general welfare and prosperity of the whole city.

There is an intimate and necessary relation between conservation of property values as here proposed and the conservation of public health, safety and general welfare. Throughout a city the areas in which values have been depressed by the invasion of inappropriate uses or lack of building control as to height, courts and open spaces, are the areas in which the worst conditions as to sanitation and safety prevail and where there is the greatest violation of the things essential to public comfort, convenience and order. The decline in property value in such districts is merely an economic index of the disregard of essential standards of public health, safety and convenience in building development. Moreover, a depressed district of changing occupancy is almost always a district in which unwholesome home and work conditions prevail. The old building altered to suit a new use is usually very faulty in light, air and sanitation. Declining values make it difficult or impossible to enforce proper standards. These depressed districts create the most difficult and perplexing problems in the establishment and administration of housing and factory regulations.

Moreover, the enormous losses sustained by owners of loft and tenement property will be a serious handicap to the provision of future buildings to house the increasing population and the rapidly expanding industrial development. This may become a very serious matter from the point of view of cheap and adequate housing and safe and convenient factory space.

With some eight billions already invested in New York City real estate and the certainty of added billions in the coming years, a plan of city building that will tend to conserve and protect property values becomes of vital importance not only to individual owners but to the community as a whole. Why not protect the areas as yet unspoiled and insure that the hundreds of millions that will be spent in the improvement of real estate in the coming years shall contribute to the solid and permanent upbuilding of this great city. Permanence and stability can be secured only by a far-sighted building plan that will harmonize the private interests of owners and the health, safety and convenience of the public.



Base Map Reproduced by Courtesy of Ohman Map Company.

FIG. 5—UNIMPROVED PROPERTY IN BROOKLYN, 1913.
Black indicates unimproved land.

CHAPTER III—USE DISTRICTS

The Districting resolution herewith submitted, together with the accompanying use district maps, provide for four classes of use districts: (1) residence, (2) business, (3) unrestricted, (4) undetermined. The proposed regulations apply only to future buildings and do not interfere with any existing structure or occupancy.

In a residence district all kinds of business and industry are excluded. Dwellings, private clubs and most institutional buildings are permitted. The term "dwelling" includes an apartment house, tenement house, boarding house, or a hotel having thirty or more sleeping rooms. The usual accessory buildings, such as private garages, are permitted but they must be located on the same plot with the building to which they serve as accessory. A private garage for more than five motor vehicles would, however, be excluded. A private club that has as its chief activity a service customarily carried on as a business, such as a garage, would be excluded. While the regulations are not intended to interfere with a doctor or dentist who practices his profession in the usual inconspicuous way in his private dwelling, they would exclude any business such as a store in connection with a tenement, club or hotel. It is provided, however, that the superintendent of buildings[1] may, after notice and hearing and with appropriate conditions and safeguards, permit in a residence district any building or use in keeping with its use for residence purposes.

In a business district, residence and business uses are permitted but industrial uses are either prohibited entirely or limited in the percentage of floor space they may occupy. A list of specified industries and uses of a clearly objectionable character are entirely excluded, as are also all other uses that are noxious or offensive by reason of the emission of noise, odor, dust, smoke or gas. No building may be used for factory purposes in excess of 25 per cent. of the total floor space of the building, but a space at least equal to the ground area of the building or lot may be so used. The term "factory" is defined as a building or portion of a building in which six or more persons are employed in any process or part of a process of transforming or converting raw material, partly wrought material or imperfect material into forms suitable for use.[2] This limited provision for factory use in a business district is appropriate both on account of the considerable percentage of factory use required in connection with the retail trades and on account of the numerous customary small trades and factory uses that are necessary or desirable for the convenience of the neighborhood and, if limited in size, are not objectionable from the point of view either of the business use of the street or of the residential use of the adjacent areas.

A garage for five or more motor vehicles[3] will be excluded from a business district except that with the approval of the building superintendent[1]

[1] This discretion vested in Board of Appeals in Resolution adopted July 25, 1916.
[2] Definition of "factory" omitted in Resolution adopted July 25, 1916.
[3] Changed to "more than five motor vehicles" in Resolution adopted July 25, 1916.

and after notice and hearing, a garage may be erected in a business district on any portion of a street between two intersecting streets on which there exists a public garage at the time of the passage of the proposed resolution. A similar regulation is provided in regard to stables. In the tentative report it was proposed to permit public garages and stables in any business district, but the nuisance features incident to the indiscriminate location of garages throughout the business districts were so great that the Commission reconsidered its former action. In providing that garages shall in general be forced to go to the unrestricted districts, the Commission has increased the number of small unrestricted sections within convenient access of the local residence and business centers.

The terms "unrestricted district" and "undetermined district" are used to designate the areas for which no restrictions or regulations as to use are provided. It is assumed that the development in the unrestricted districts will be largely industrial. In the undetermined districts either a residential, business or industrial use may prove the more appropriate, depending largely on future port and terminal developments. The undetermined districts differ from most of the other unrestricted areas, chiefly in that it is anticipated that when their appropriate use is more fully disclosed it may seem wise to restrict them in part to business or residence use. The aim has been to give the greatest possible freedom of action and to avoid restrictions that may possibly hinder future growth and development. While it is realized that this can only be partially successful and that any regulations now imposed will have to be changed from time to time, it seems important that they shall be so designed as to secure as high a degree of permanence as is at present practicable.

In general, the salt marshes along and running back from the waterfront have been included in the unrestricted district. Industry very naturally pre-empts such localities both on account of the comparative cost of the land and the possibility of good water and rail terminal facilities. In addition, all other navigable waterfront, where the grades and location are favorable to a commercial or industrial development, is left unrestricted. The unrestricted area is allowed to extend back from the bulkhead line 1,000 feet or more, depending largely on the slope of the land. In many cases the boundary line of the waterfront unrestricted district follows quite closely the 20-foot contour line. This seems to be about the normal level to which industry will extend back from the water.

An examination of the historical maps prepared by the Commission showing industrial development at various periods during the past sixty years in Manhattan and Brooklyn shows surprisingly little change in the breadth of the industrial belts extending back from the waterfronts. There has doubtless been a great deal of change in the character of the industries located in a particular section. The tendency has been for the heavier bulkier types of industries requiring large plots to move from Manhattan. They have been replaced by a much larger number of industries requiring

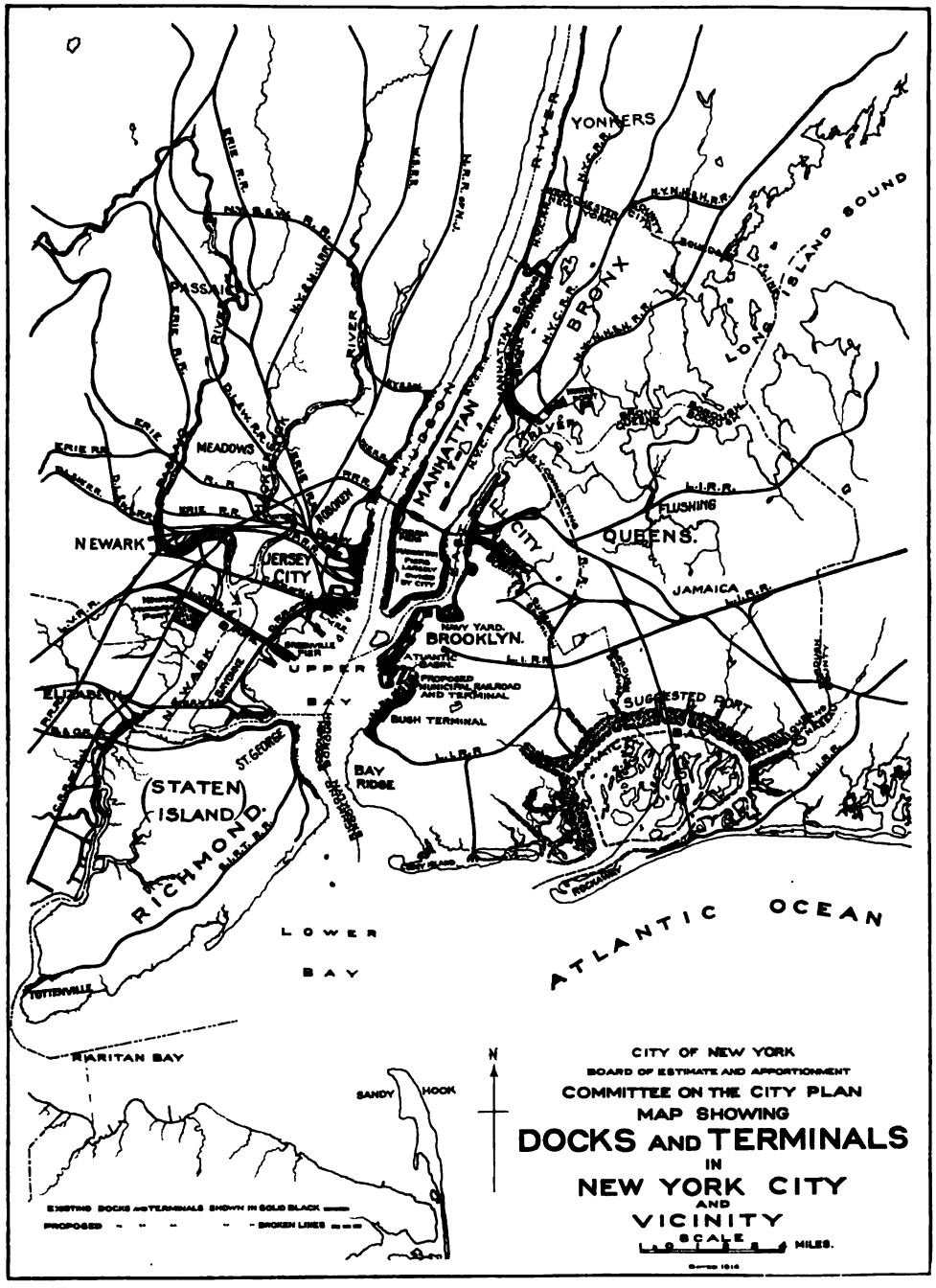


FIG. 6—DOCKS AND TERMINALS IN NEW YORK CITY AND VICINITY.

MAP SHOWING PLACE OF WORK OF FACTORY EMPLOYEES, 1913

Data Supplied by Division of Industrial Directory, State Department of Labor. Each dot represents 250 employees.

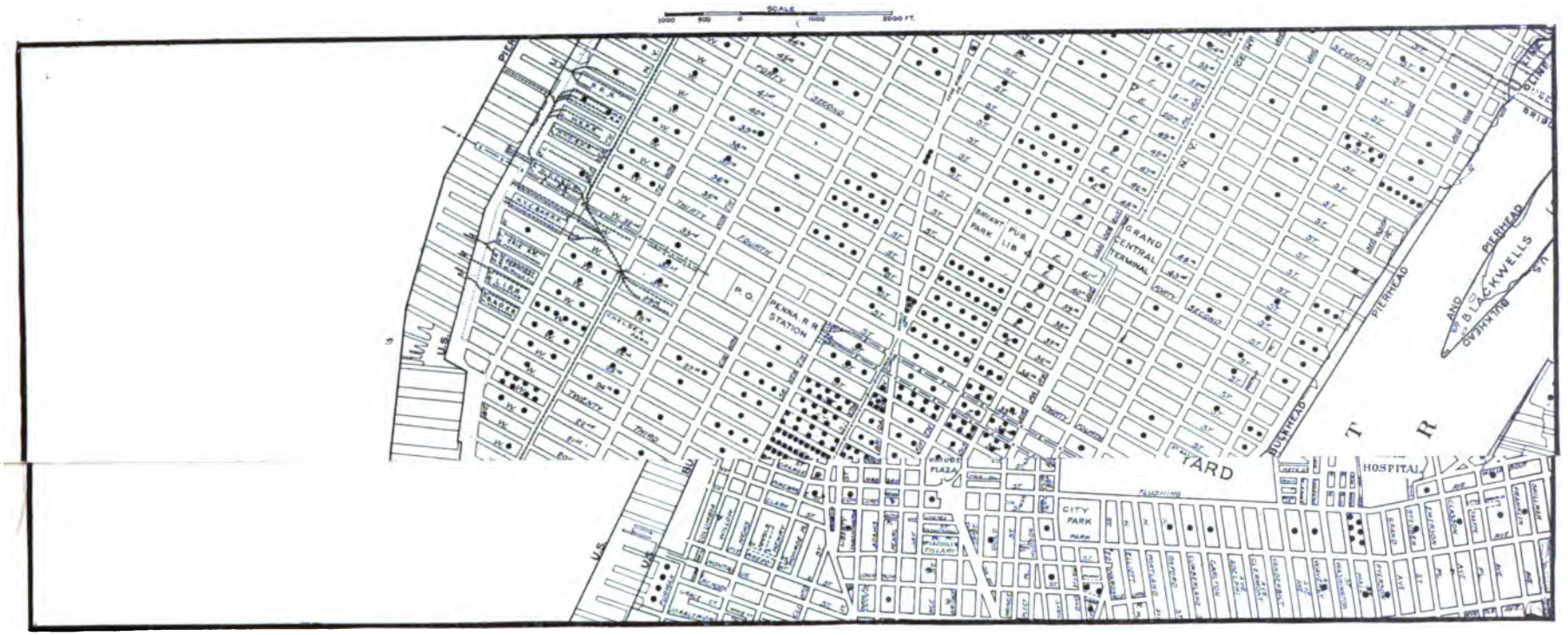


FIG. 7.

It will be observed when comparison is made with the population spot map, Fig 20, that the area west of Broadway between Chambers Street and West Thirty-third Street, which houses a dense factory population, has comparatively few people living therein. Large numbers of the factory population evidently live in the densely populated area on the east side within walking distance of the factories.

less ground area per industry without greatly changing the aggregate requirement for ground area.

The segregation of factories will directly reduce production costs. It will make it possible to have the best rail and water terminal facilities and the best express and mail facilities. It will reduce trucking and thus improve street traffic conditions. It will tend to the segregation of heavy trucking from other classes of street traffic and thus further tend toward the improvement of street traffic conditions.

Furthermore, the segregation of factories along the rail and water terminals and their consequent exclusion from the residence sections will improve living conditions throughout the city. A factory is usually a nuisance in a residence section. It is often directly injurious by reason of noise, odor, dust or smoke. It always brings heavy trucking with attendant noise and danger to the safety of the children, especially in crowded tenement districts. It often subjects the neighboring residents and property owners to increased risk from fire and explosion.

The problem of congestion of population is closely related to the location of trades and industries.[1] Employees working long hours at low wages can afford neither the time nor the money to live far from their work. It has been shown that a very large proportion of such employees will live within walking distance of their work, even though this necessitates their living in the most congested and unwholesome quarters. While the proposed plan for residential and industrial districts will not cure existing conditions it will help to prevent an extension of such conditions. This is insured by providing adequate housing areas adjacent to the factory areas and preventing for the future the encroachment by the factories on areas required for housing.

While economic forces are quite effective in securing the segregation of industries of the heavier type close to the water and rail terminals, there are in New York City an unusually large proportion of industries that are not subject to this segregating influence. New York City is pre-eminent as a light manufacturing center. Of the 680,510 persons employed in industries in New York City in 1909, 422,769 were employed in the following light industries:

Artificial flowers, feathers and plumes	9,759
Boots and shoes	9,177
Boxes	9,414
Bread and bakery products	20,401
Buttons	3,635
Clothing, men's	77,543
Clothing, women's	110,567
Confectionery	7,641

[1] See Figure 7 and Figure 20. A comparison of these two spot maps, showing resident and factory population, indicates graphically the relation between congestion of factories in lower Manhattan and congestion of population in the lower East Side.

Fancy articles	3,649
Fur goods	10,719
Furnishing goods, men's	8,051
Hair work	2,704
Hats and caps	5,815
Hosiery and knit goods	6,082
Jewelry	6,668
Millinery and lace goods	24,712
Patent medicines	5,450
Printing and publishing	74,118
Tobacco	26,664
	422,769

The above enumeration includes only the larger groups that may be classed as distinctly light manufacturing. Fully two-thirds of the industrial employees of the city are employed in industries that do not find direct connection with water and rail terminals a necessarily determining factor in the selection of a factory location. For these industries the questions of labor supply and market for goods are much more important. The New York Metropolitan District with a population of over 7,500,000 is itself the largest consumer of the output of its factories. Moreover, Manhattan is the great jobbing center for the entire country and this gives its manufacturers special advantages in the marketing of their goods. In addition the city has the largest and most varied labor supply. Being the principal port of entry for immigrants, it has an unlimited supply of the cheaper class of labor from which the employees of the clothing trades and various other light industries are recruited.

These light industries are scattered indiscriminately over the entire city throughout the business and residential sections. One good residence section after another has been progressively invaded and destroyed by the coming of the sporadic factory. This the proposed plan will prevent.

The great manufacturing section of Manhattan is not, as one might presuppose, along the waterfronts of the North and East Rivers, but lies in a narrow belt through the center of the Island from Canal Street to about 38th Street.[1] The northward progress of the factory zone during the past sixteen years above 14th Street has been attended by tragic consequences. The city's chief hotel and retail center was invaded and substantially destroyed. It was compelled to move north to 34th Street and is now again in danger of destruction. The simple fact is that under New York City conditions, with high loft buildings and congested streets, the chief hotel, club, theater and shopping center cannot exist in close proximity to the factories. In the side streets along the lower portion of Fifth Avenue the number of employees is so great that the surrounding streets are necessarily

[1] See factory employee spot map, Figure 7. Note the narrow black belt from Canal street north to about 38th street.

South 4th Street, Near Berry Street.

Factory among residences.

Thompson Street, Near West Houston Street—Factories in heart of a tenement house district.

East 9th Street, Between Avenues C and D—Sawmill near tenements.

Prospect and 11th Avenues—This steam laundry has retarded development in this entire section.

FIG. 8—FACTORIES IN RESIDENCE STREETS.

Factories in residence streets are detrimental to the public health and welfare because they obstruct light and ventilation, disturb the peace and quiet of homes, often emit dust and noxious odors and convert sidewalks into dangerous loading platforms.

A Lunch Hour Crowd of Garment Workers on Fifth Avenue at 20th Street.

Fifth Avenue at 34th Street.

FIG. 9—FIFTH AVENUE.

West 38th Street, near Fifth Avenue.

West 35th Street, near Fifth Avenue.

FIG. 10—CONGESTED SIDE STREETS WITH COMBINED TRAFFIC OF BUSINESS AND HIGH LOFT BUILDINGS.

congested with pedestrians during the hours when the workers are going to or returning from work. At the noon hour when the workers come out from the factories for a stroll along Fifth Avenue they monopolize the sidewalks to the exclusion or serious inconvenience of those having business on the avenue. An intensive factory use on the side streets is fatal to the business use of the avenue. The sidewalk space is needed by the workmen and the roadway space is needed for the trucking incident to factory use. On the other hand, all the available roadway and sidewalk space would be unduly congested if reserved solely for business use. Two bodies cannot occupy the same space at the same time, and even if there were more space available it would be difficult to harmonize an intensive use of roadways and sidewalks for two such widely different purposes.

Traffic conditions are the crux of the situation. It is vital to the existence of the city that it maintain such conditions of street traffic that the city's chief hotel, club, theater and shopping center may permanently be maintained in the sole location that is suited for it. The plan proposed will protect the entire Fifth Avenue and Broadway section south as far as 23d Street and between Fourth Avenue and Sixth Avenue.

The exclusion of future factory lofts from the above section will also result to the economic advantage of the manufacturing industries concerned, to the welfare of the workers and to the relief of the city's congested transit facilities. The factories will be located on cheaper ground, nearer to rail and water terminals and nearer to an adequate labor supply. They can, if they find it desirable, maintain salesrooms in the restricted district. The workmen will be able in greater proportion to live within walking distance of their work. This will be a boon to the workers who walk, in that it will save them carfare and the necessity of spending about an hour and a quarter a day on the cars under conditions of overcrowding that are a menace to health, comfort and safety. And just to the extent that they do this will this condition of congestion be relieved for those who will still have to ride on transit lines during the rush hours.

Retail business naturally tends to segregate. The grouping of a few of the neighborhood stores and business buildings on the main avenue or thoroughfare creates the center that attracts other stores and makes that particular street the most desirable place in which to do business. In spite of this strong trend toward segregation, unless prevented by law, the occasional store will come into the midst of a residential community, to the detriment both of the residential section and of the natural local business street.

In residential neighborhoods the plan has been to preserve the side streets wherever possible for strictly residential use. The avenues along the ends of the block and main thoroughfares have usually been included in the business districts. The business use on the avenue is permitted to extend 100 feet back along the residential side streets. In the less developed sections it has often seemed feasible to indicate only every second or third

avenue for business use and thus secure a larger and more self-contained residential area. This, it is believed, will improve living conditions and will conserve values on both the business and residence streets.

The amount of space needed for retail business purposes depends a good deal on the economic condition and habits of the population. Generally speaking, the smaller the average income per family the larger the proportion that will be spent in the purely local stores. In the case of the very poor, practically the entire income is spent in the local stores. On the other hand, the well-to-do make a very large proportion of their purchases outside of the local area. The local retail section of a well-to-do neighborhood may be confined to a very limited variety of shops. Consequently, a tenement section requires a much larger allowance of retail business space than an elevator apartment section. It is believed, however, that even in the most crowded tenement sections, if business had been confined to the avenues along the ends of the blocks, sufficient business space would have been provided and living conditions in the side residential streets would have been very greatly improved. In an elevator apartment section a business street every second or third avenue is ample.

The protection of the home environment is vital to the welfare of the state. It needs no argument to demonstrate that a business or industrial street does not furnish the most favorable environment for a home.

Quiet is a prime requisite. The zone plan, by keeping business and industrial buildings out of the residential streets, will decrease the street traffic in the residential sections and thus reduce to a minimum noise incident to street traffic. Aside from the increased vehicular traffic the business and industrial uses disturb the quiet and peace of the residential street by the crowds of employees and others incident to a business or industrial use. The above evils are present even though the business or industry is in itself entirely unobjectionable from the standpoint of noise. Dr. Gustave F. Boehme testified that business and industrial uses on a residential street and the noise and confusion incident thereto made such streets much less healthful and desirable for residence purposes. He said that such conditions tended to produce and intensify all kinds of nervous disorders.

The efficient cleaning of the streets and the collection of refuse are of great importance to the health and welfare of the city. The segregation of uses will make it possible to adopt more efficient and economical methods for each particular street or section. It is recognized that for sanitary reasons a residential street should be kept cleaner than a business or industrial street. If, however, there is a mixed occupancy, residential, business and industrial, the traffic, trade wastes and litter incident to business and industrial use may make it physically or economically impossible to keep the street in the good sanitary condition demanded for residential use. John T. Fetherston, Commissioner of Street Cleaning, testified on this point as follows:

> "It is well known that where different public conditions exist in any particular locality, it is impossible to adopt a single uniform

East 5th Street, near Avenue D—Wetwash laundry, sawdust factory, planing mill, near tenements.

Lafontaine Avenue, corner 179th Street —Hat factory and tenements.

West 166th Street, between Audubon and Amsterdam Avenues—Beer bottling works near tenements.

FIG. 11—THE ENVIRONMENT OF THE HOME.

The Commission believes that the environment of the home should be guarded and protected in every possible way.

Elizabeth Street, Corner Broome Street—Ice plant in a tenement district. The noise of this plant continues all night.

31st Street and Eleventh Avenue — Railroad yard surrounded by tenements.

Milk Depot—Corner 180th Street and Park Avenue. Showing proximity of apartment houses.

FIG. 12—NOISE AND THE HOME.

The noise and confusion always more or less in evidence in congested sections are bad even under the best conditions, but when aggravated by heavy trucking in the streets and by the machinery of nearby factories they become a serious menace. When these noises continue throughout the night, as in the case of public garages, ice plants and milk bottling and distributing stations, the evil is enormously increased.

system for cleaning streets as well as collecting refuse in that locality. On the other hand, where the district is of a mixed type, involving industry, manufacturing, as well as a residential section, it is not possible to plan the most economical system of street cleaning and refuse collection, because conditions will differ in various parts of such intermixed districts. I would say, in general, that the development of the zone system, involving an orderly development of building zones, should ultimately tend to economy in the cleaning of streets and in the collection of refuse, as well as providing a plan and a system which will meet particular conditions of each district or section dependent upon the uses to which the section or district is put. The demand for sanitation varies with the type of building occupants. A residential street requires at least a higher standard of street conditions than would a business or a mixed type of street, and a great many complaints come to the Street Cleaning Department from streets where mixed business and residential occupancy is in force. If stores could be segregated, plans in that connection could be adapted to that particular type of street, whereas, if conditions are mixed, you can only compromise.

"There are some streets in lower Manhattan where it is hardly possible to clean the streets during the day time on account of the procession of vehicles which prevents the cleaners from collecting the street dirt. On that type of street the same sanitary conditions cannot be maintained as would be required in a residential street. In that respect traffic conditions in a residential locality also adversely affect the street because there may be a residential street which connects with a traffic street, and it is not possible to keep that residential street in as good a condition as other similar streets in the same locality, because the men cannot work advantageously while traffic occupies the street. Even in the case of mixed occupancy of a particular block, residence, business and factory use, the factories and business places in that particular block tend to bring heavy traffic into the block and make it difficult to keep it in the best sanitary condition."

In a residential street the number of street accidents, chiefly to children, varies directly with the vehicular traffic. Stores, garages, factories and other business buildings increase the amount of vehicular traffic. Most side streets that have no business or industrial buildings have little traffic. Very often a single business building in the midst of a residential block will so increase traffic as greatly to increase the number of street accidents. This will be particularly true if it is a congested tenement district. Here the streets swarm with children. They must have some place to play and unfortunately there is no place but the street. A very large proportion of street accidents occur to children while playing in the streets in front of their homes. The zone plan will, as to the future, segregate the business

and industrial buildings from the residential streets and thus tend to reduce the enormous toll of street accidents.

In the crowded tenement districts having stores on the ground floor, the roadways are congested with vehicular traffic and push carts and the sidewalks with business encroachments and pedestrians. There is absolutely no place for the child to exercise natural play instincts. Play is as necessary to the child as food and clothing. It is this thwarting of the boy's craving for play that leads to a large proportion of the juvenile delinquency cases that come before the Children's Courts. Ernest M. Coulter, for ten years clerk of the Children's Court, testified he had found by investigation that this thwarting of the play instinct was responsible for at least 40 per cent. of the delinquency cases. While the population of the city is largely recruited from the country, the city's criminal population is largely bred right within its own congested centers.

The moral influences surrounding the homes are of the greatest importance. The sordid atmosphere of the ordinary business street is not a favorable environment in which to rear children. Immediate and continual proximity to the moving picture show, dance hall, pool room, cigar store, saloon, candy store and other institutions for the creation and satisfaction of appetites and habits is not good for the moral development of the child. Influences and temptations resulting from the proximity of such business to the homes may affect seriously the morals of the youth of the community. Under such conditions it is difficult to cultivate the ideals of life that are essential to the preservation of our civilization.

Rowland Haynes, an expert on recreation facilities and secretary of the Committee on Recreation of the Board of Estimate, testified to the practical impossibility of providing enough playgrounds for the children in the crowded tenement sections and to the relief to this situation that the districting plan will afford by creating residential districts from which business and industry will be excluded and which can therefore be used as temporary play spaces. Mr. Haynes said:

> "The advantage to the whole recreation problem lies in having reserved residence streets. By having streets reserved for residence purposes it is going to be possible, since the delivery traffic in such streets will be comparatively light, to use some of them for temporary play places, as was done by the Police Department in about 25 locations last Summer. The only thing I wish to emphasize is the urgency and importance of such possibilities which are opened up by the action of your Commission.
>
> "In the first place, we have to realize that through some studies which we had previously made we have found that wherever the density of population exceeds 37.5 per acre, about 80 per cent., in fact, somewhat over 80 per cent. of the children have to play away from home, either because there is no place in their own back yards

Henry Street, near Rutgers Street.

Oak Street, between James and Oliver Streets.

Oliver Street, between Madison and Oak Streets.

Henry Street, near Market Street.

FIG. 14—THE STREET AS A PLAYGROUND.

The more business there is on the street the more inappropriate, dirty and dangerous it becomes for play purposes. In congested sections the street is often the only play space for the children. The trucking incident to a factory or business use will necessarily greatly increase the dangers of the street as a playground for the children.

or because that space is so small that they have no chance to play any of the larger space games. Out of the 54 wards in Manhattan and Brooklyn, all but seven exceed that density. If we take the city as a whole, including all of the boroughs, we find that 84 per cent. of the population of New York live in districts where the density exceeds this figure of 37.5 per acre. Some neighborhoods in New York go up to 18 times that density. If we take 84 per cent. of the whole number of children in this city between 5 and 15 years of age as the number living in these more densely populated districts, and if we then take 80 per cent. of this 84 per cent. as the number who will have to play away from home, we find about 680,000 children in New York City who have got to play away from home. The average daily attendance last summer at all the playgrounds in New York City was less than one-third of 680,000. This includes the average daily attendance at park playgrounds, school playgrounds and playgrounds conducted by settlements and other philanthropic agencies. In other words, all the public and private agencies which we now have are reaching only about one-third of the child population who must play away from home. Seventy-five per cent. of these playgrounds close after the summer season. This means that larger opportunities for play are urgently needed. To purchase enough additional places to reach the remaining two-thirds of the children who must play away from home would bankrupt the city. Hence we must use more intensively the land that the city already owns. Hence the method which was introduced last summer by the Police Commissioner of using streets reserved for play for certain hours in the day in certain districts, it seems to me, must for some time to come be extended. My only purpose in accepting the invitation of your Commission to speak thus briefly is to point out that, while this plan of use districts is worked out for a different purpose, it is going to be of very genuine and fundamental value to conditions which we don't like but which we have got to face in the playground and recreation situation here in New York.

"The restricting of residential streets against factories and against stores and against public garages make those streets better for play use, first, because it reduces the amount of traffic in those streets. It makes the traffic in those streets simply delivery traffic for household necessities, which is much less than any through traffic or traffic to garages, or delivery traffic to and from stores. It reduces the amount of traffic and thus makes the burden of reserving a street for play purposes much less. In the second place it makes possible the reservation for play purposes of residence streets which are near those on which the children are living. In short, it makes possible the reservation of play streets without burden to traffic and near where they are needed."

Fire insurance rates recognize the distinctly greater risk of the tenement with stores on the ground floor as compared with the tenement without stores. Increased fire risk for the tenement with stores must necessarily mean increased fire risk for all neighboring buildings. The menace to neighboring residential buildings in the case of an ordinary store is multiplied in the case of a theater, garage, warehouse or factory. Even where in the case of a tenement with a store on the ground floor the firemen succeed in preventing the fire from spreading to the tenements above, it may cause serious loss of life from smoke or panic. Chief Kenlon testified to the desirability from the standpoint of fire prevention and safety of providing for the establishment of residence districts from which stores would be excluded. Edward R. Hardy, assistant manager, New York Fire Insurance Exchange, produced statistics and evidence of the increased fire risk to tenements having stores on the ground floor. Mr. Hardy said: "The rate of insurance in a store and dwelling building reflects greater insurance risks. The ordinary private dwelling, now accepted as a building occupied by not more than two families, if it changes its character so that the first floor or basement is occupied for a store, with one family above, the insurance rate is about twice as much as when it was occupied wholly for dwelling purposes. This is due to the fact that the store brings always an unknown quantity of waste material, poor protection to stoves, gas lights, care of ashes and ordinary accumulations—the risk is about two to one. Even if special precautions are provided to prevent the spread of fire from the business building to the tenement above there is great danger, especially on the ground of safety to the occupants of the tenements. The proposition frequently advanced that the first floor is so protected that there shall be no communication when there is a store in the basement with the floors above, overlooks the fact that in a fire the smoke will always seek any exit available. It will ascend naturally if there is a way. If not, it will pour out of the doors and windows and follow up the side of the building and enter the living floors in that way. Some of the most serious panics have been due not to fire, but purely to the smoke condition."

That the invasion of the residential street by trade and industry is generally recognized as a serious evil by the residents themselves, has been conclusively demonstrated by experience. With the coming of trade and industry those residents who can afford to do so leave the street, rents fall and the lending institutions call their loans. The combination of reduced rents and higher interest rates leads to many foreclosures and places most owners in such a precarious financial position that they are unable to make needed repairs and improvements. It becomes difficult or impossible for the city authorities to enforce even minimum standards of public health and safety.

Goerck Street, Near Rivington Street—Junk shop near tenement, barber shop and "stoop nursery." Note the mother sweat shop worker sewing coats at the stoop.

No. 16 Morton Street—Rag and junk shop next to tenement.

East 4th Street, Near Lewis Street — Scrap iron yard in rear of tenements.

FIG. 15—JUNK SHOPS IN CONGESTED TENEMENT STREETS.

Junk and rag shops menace home life in tenement districts as does perhaps no other line of business. The habitues of these places are not an asset to any street in which children must play, nor is the storage of disease-laden rags and junk in street and yard a desirable feature of these districts.

378 Broome Street—Horseshoer and wagon builder near tenement.

West 24th Street, between 10th and 11th Avenues—Horses on the sidewalk being shod.

East 92nd Street, between First and Second Avenues—Horseshoer and stables near tenements.

238 East 85th Street—Wagon builder in tenement house district.

FIG. 16—HORSESHOEING IN CONGESTED TENEMENT STREETS.

Horseshoeing is especially objectionable in congested tenement districts, because it brings horses upon and across the sidewalk and is the source of much noise and of a particularly obnoxious odor.

807 Bedford Avenue.

1038 Bedford Avenue.

112th Street, west of Lexington Avenue—Soda fountain supplies and carbonic gas.

FIG. 17—STORES INVADING RESIDENCE STREETS.

The usual objections to business in the midst of residences are accentuated when extensions to residences are made to project beyond the fronts of others, thus obstructing light and view.

East Broadway, near Pike Street—Express "Office."

East 4th Street, near Avenue A—Furniture.

East 3rd Street, near Avenue C—Wholesale Liquor.

East 3rd Street, near Avenue C—Wholesale Grocer.

FIG. 18—SIDEWALK OBSTRUCTIONS INCIDENT TO BUSINESS USE.

CHAPTER IV—APPROPRIATE INTENSITY OF THE USE OF LAND

For city building it is not alone necessary that there shall be a plan that will segregate buildings according to use, but it is also necessary that there shall be a segregation according to intensity of building development. This is essential in order to secure to each section of the city as much light, air, safety from fire and relief from congestion, with all its attendant evils, as is consistent with the most beneficial use of the land. Intensity of use should be so regulated that assuming that the entire section should be built up uniformly with buildings of the maximum height and extent allowed the section as a whole would be appropriately improved.

The maximum beneficial use of any given block or area is dependent on a certain measure of uniformity in its development as regards height, yards and open spaces. Such use would, in general, be enhanced if the property owners could enter into an agreement uniformly restricting the height of buildings and fixing the minimum area of courts and yards. The size of courts and yards is in most cases of as much benefit to a man's neighbors as to himself. It is therefore appropriate that each should contribute in substantial equality to the common stock of light and air. There can be no maintenance of healthful conditions of light and air and no stability of values if each individual owner is at liberty to build to any height and over any proportion of his lot without regard to his appropriate and reasonable contribution to the light and air of the block.

The speculative builder puts up the first high building in a block. The windows are on property lines or on narrow courts. Perhaps a five-foot rear yard is provided. But with all the free space on the adjacent lots the building is light and airy, is attractive to tenants and shows a good return to the purchaser. Other buildings follow and their builders see no reason why they should keep down lower or provide larger yards or courts than the first. The result is tragic from either a private or a public point of view.

All this has been conclusively demonstrated by costly experience in the recent history of the office and loft building sections of Manhattan. Whole areas have been built up piecemeal with towering buildings having inadequate courts and yards without much thought of ultimate consequences. Such areas are in process of being smothered by their own growth. The streets are inadequate to handle the traffic induced by the multiplication of floor area to be served, and the buildings constructed without reference to the width of the streets, yards and courts on which they abut shut out light and air essential to health and to rental on a basis that will permit of a reasonable return on the investment.

The social and economic desirability of limited height and minimum court and yard provisions has been clearly established by apartment house construction under the Tenement House Law. Had similar regulations

been applied to the office and loft buildings, great loss would have been prevented. All agree that the Tenement House Law accomplished a most desirable reform in the interest both of owners and tenants in establishing regulations as to height, area covered, yards and courts. In exclusively residential blocks in certain of the more intensively developed sections light and air conditions have been standardized and property values stabilized by ensuring that each owner shall make a reasonable contribution to the light and air of the block.

Only by a complete districting plan can the mutually advantageous principle contained in the Tenement House Law be applied to all kinds of buildings, in all parts of the city. There must first be a partial segregation of buildings according to use, and second, a gradation of height, court and yard provisions, particularly as affecting residential buildings, in accordance with the present and prospective intensity of use in the various sections of the city.

The intensity of building development appropriate for each district is dependent on the character of occupation and use in that particular district. Certain trades and industries require structures of unusual size and shape. A comparatively high degree of concentration is important for the facilitation of business in an office district. The demand for housing varies with the differing tastes and necessities of the inhabitants of the city. There is a demand and a need for single-family dwellings, as well as for hotels and apartment houses.

In building a city it is sometimes assumed that we should start with a certain model type of residence and seek to make that type universal. If a density of not exceeding eight families to the acre is desirable, building regulations should be devised to prevent a greater density. The problem is not so simple. The problem of housing accommodations and desirable densities cannot be profitably considered without reference to a particular city, with a known topographic, transit, commercial and social organization and an assumed probable rate of increase in population. We cannot annihilate time and space, and as long as these factors are appreciable the problem of the appropriate intensity of the use of land must always remain relative. There can be no absolute standard.

Most men in choosing a home in a large city must weigh various divergent considerations and strike the balance that gives a maximum of satisfaction. They have to sacrifice a desire for open space and isolation in order to save time and money and avoid great personal inconvenience. Many families prefer Manhattan apartments for social reasons or because of proximity in time and space to clubs, hotels and theatres, or because of nearness to place of business or work. In choosing a home the business man who works from 10 A. M. to 7 P. M. at his office, and the laborer who works in a Manhattan factory from 7 A. M. to 6 P. M. are both likely to sacrifice the numerous advantages of a suburban villa for the convenience of a Manhattan apartment or flat.

West 40th Street, Broadway to Sixth Avenue.

Fourth Avenue, between 24th and 25th Streets.

West 40th to 41st Streets, West of Sixth Avenue.

FIG. 19—WINDOWS ON LOT LINES.

A thousand windows to catch a neighbor's light. Most of the windows here shown are on the lot line and subject to obstruction at the will of the adjoining owner. The possibility of erecting buildings such as these artificially inflates certain values which are violently depressed by the erection of a high building adjoining. The proposed height and area restrictions will tend to stabilize values.

That considerable areas near the heart of the city should be very intensively used for tenements and apartments is natural and probably inevitable. The demand for housing is naturally greatest in the most favorable locations. Were it not for the ability to multiply housing area by placing one dwelling on top of another, rents would be prohibitive in these favored locations for practically all of those who now occupy apartments or flats. It is natural that the intensity of the demand for housing should vary in the different parts of a given city, the general tendency being, starting with the highest intensity of demand near the center, for this demand to fall rapidly toward the periphery of the city.

Beyond the central zone of the more intensive housing, the provision of light, air and open space, may be rapidly increased. Radiating from the common business center, the amount of land available for development rapidly increases. When it is necessary to use a rapid transit line to get to the business center a few minutes more or less on the train is unimportant. Beyond this central housing zone, therefore, regulations requiring much more adequate courts, yards and open spaces, may properly be required.

The assumption that an individual owner in a city should have unlimited liberty to cover his entire lot to any height is incompatible either with the interests of owners generally or with that of the public. It is not possible to secure the light and air that is essential both to the profitable use of land and to the health and comfort of the public unless the height and area covered by buildings is limited. As Professor Whipple has well stated: "While in general rights in the use of land are bounded by vertical planes, it must not be forgotten that the sun's rays fall slantingly upon the land while the wind movements are chiefly horizontal. These natural elements are interfered with by excessively high and crowded buildings, hence there are rights in land ownership which extend beyond the vertical planes." In a memorandum submitted to the Commission, Professor Whipple discusses the importance of light and air in part as follows:

> "Considered from the standpoint of light the sun's rays profoundly affect the lighting of rooms. This is a matter of common knowledge, but quantitative relations have been shown by many photometer tests made at points located at different distances from windows, and by similar tests made at the windows of different stories in tall buildings the exterior lighting of which is influenced by adjoining buildings. Sunlight likewise causes movements of the air. This is due to unequal heating in different places. The air currents thus set up are gentle and desirable. Places which never see the sunlight are more likely than others to contain stagnant air. The sun's rays have a marked disinfecting action and prevent the growth of molds and fungi, thereby eliminating odors of certain kinds. They also destroy bacterial life, whether the bacteria are floating in the air or are attached to the exposed surfaces of pavements, floors or

walls. To the extent to which this occurs the danger of infection from certain disease germs is lessened. Sunlight has both a physiological and psychological influence on human beings.

"By daylight is meant the indirect lighting from the sun, that is, lighting received from the sky or clouds and reflected from various surfaces. While it is possible for human beings to exist without direct sunlight and even without daylight, it is the experience of the race that both sunlight and daylight in sufficient amounts are highly desirable. Daylight is necessary not only for health and comfort but for economic reasons. Too little light causes eye-strain with its train of physiological disturbances and decreases the productiveness of work. It unfavorably influences the mental condition. Light promotes cheerfulness, while gloomy rooms depress vitality. Lack of daylight limits the length of the working day in some industries and increases the amount of artificial light required. Artificial lighting with oil or gas tends to vitiate the air by increasing the carbonic acid and moisture, and even by increasing the poisonous carbonic oxide. Artificial lighting also increases fire risks. Lack of exterior lighting increases the amount of window space required and this in turn increases the heat loss in buildings in winter. In these and other ways insufficient lighting not only results in inconvenience to human beings but may be a positive menace to the health, safety and morals of the people. The amount of daylight received in buildings is greatly affected by adjoining buildings, by their positions, their height, and by the character of their walls, both in color and material.

"The necessity of adequate ventilation need not be argued but it is not as fully realized as it should be that the air which enters a building, both in amount and quality, is influenced by the surrounding buildings. If buildings are too close together there is likely to be a stagnation of the air between them. The ventilation of streets, alleys, courts and interior spaces between buildings is as much a matter of public importance. Street ventilation is influenced not only by the orientation of the streets and the prevailing wind movements, but by the height, size, shape and character of buildings, and their distance apart. In cavernous streets there are excessive air currents near the ground, and at times great air movements, especially objectionable in winter. On the other hand, at times of gentle air movements there may be no currents at all near the streets and pavements between high buildings because the friction of the air passing through the narrow channels prevents them. In other words, narrow streets lined with high buildings tend to produce extreme conditions of air movement and both extremes are objectionable. In regulating the size and height of buildings with reference to the streets the city is to a considerable extent controlling street ventilation and the ventilation of courts and interior spaces, and thus indirectly, the ventilation of indoor quarters.

"Quite as important as the volume of air taken into buildings is its cleanliness. One of the difficulties in cities is to obtain proper air inlets for ventilation systems. The amount of smoke and dust, foul odors on the streets, bad smells from buildings, from passing vehicles, from exposed refuse and from other sources are matters properly subject to the control of the health department but the concentration of dust and smoke and foul odors is greatly influenced by street ventilation. The regulation of buildings is a regulation of the amount of dilution of colors and is therefore a public health factor."

Exposure to a vitiated atmosphere, especially if it is of long duration, tends to break down the individual's power to resist disease. The susceptibility to respiratory affections, tuberculosis, pneumonia and colds, is particularly increased. In the treatment of disease pure air is of the greatest curative value. The importance of direct sunlight on health is hard to over-estimate. It serves as a beneficial stimulant to the nervous system. In the destruction of bacteria it is better than many artificial disinfectants. An increased supply of sunshine in an apartment means decreased dampness. The highest medical authorities all agree that the action of the sun's rays upon air is prophylactic, rendering the environment more healthy. Good natural light and ventilation alone are not enough, direct sunlight is also important.

Light and air are so important that their provision should be required in every section of the city up to that point at which their benefits as to that particular section tend to be outweighed by other needs and requirements of city life. Under New York City conditions the upper limit would probably be the single detached house on a forty or fifty-foot lot with ample open spaces about it. This the proposed E district regulations would in large measure secure. At the other extreme the minimum provision of light and air assuredly should not be less than that required by the present Tenement House Law. For large areas in New York City neither of the above extremes furnishes an appropriate standard. The one and one-half and one times height districts and the C and D area districts will supply the demand and need for light and air standards between these two extremes.

From the point of view of public advantage the distribution of population is very important. Most of the evils of city life come from congestion of population. In precisely the measure that the city's population can be distributed will those evils be mitigated. As the number of families housed per 50-foot lot increases:

(1) The provision of light and air, so essential to health, vitality and comfort decreases.

(2) The opportunities for personal contact and thus for the spread of communicable disease increase.

(3) Noise and confusion incident to increased street traffic increases.

(4) Each family suffers more and more from the noises from neighboring families.

(5) Privacy is diminished.

(6) The children have less and less opportunity for outdoor play.

(7) The danger from fire, both to life and property, is increased.

(8) The transit lines become more and more congested during the rush hours.

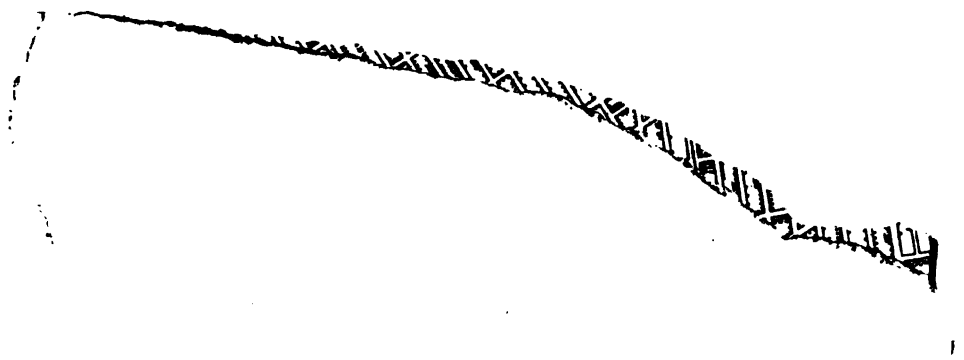
It is therefore essential in the interest of the public health, safety, comfort, convenience and general welfare that a housing plan be adopted that will tend to distribute the population and secure to each section as much light, air and relief from congestion as is consistent with the housing of the entire population for a considerable period of years within the areas accessible and appropriate for housing purposes.

In order to provide the people of the city with the kinds of homes that they desire, are willing to pay for and that will bring the maximum advantage from the point of view of public health and safety, it is absolutely necessary to district the city in such a way as to encourage and conserve particular types of building in particular sections.

The control of the intensity of use of land cannot safely be left to economic forces. Unless for each section standards of height and area covered are fixed, the tendency will be to build up solidly to the extent permitted by the Tenement House Law. The real demand for single family houses and for multi-family houses with adequate yards and open spaces will not be supplied because builders and investors have learned that such developments are in danger of being ruined by the erection of a few neighboring buildings of a different and more intensive type.

Tenants move away from the congested centers in order to secure better light and air. But if after a few years the bright, sunny building to which they have moved becomes surrounded by buildings similar in height, yard and court provisions to the building in the congested center in which they were formerly located, the desirability of the new location for this class of tenants disappears and rentable values are likely to be seriously impaired. A proper districting plan will insure that wherever probable intensity of demand will permit, a certain measure of the improved light and air conditions that have attracted tenants to the new location shall be permanently retained.

Private developers in suburban residence districts have found that in order to attract purchasers it is necessary to place uniform restrictions on the land against improvement by multi-family dwellings. The surroundings and neighborhood are all-important in securing desirable home conditions. Unless the private residential character of the section is fixed for a considerable number of years no one can afford to build a home. This method of private restriction frequently fails either because the territory covered is not sufficiently inclusive or because the restriction is limited to a short term of years. In recent years the development of detached house



sections has been greatly retarded by the fate of many such sections where by the coming of a few apartment houses the entire section has been destroyed for private house purposes. Often in such sections the apartment house is a mere parasite. There would be no economic reason for its construction were it not for the open spaces and attractive surroundings created by the private dwelling character of the neighborhood.

Many men and women would be unable to stand the strain of city life were it not possible for them to live in the more quiet, less densely populated sections. A detached house with yard and garden has kept some from breaking down under the nervous strain and has contributed to the efficiency and vitality of many others.

It is important from the standpoint of citizenship as well as from that of health, safety and comfort, that sections be set aside where a man can own his home and have a little open space about it. It makes a man take a keener interest in his neighborhood and city. It has undoubted advantages in the rearing of future citizens. The setting aside of sections for this detached dwelling type is necessary in order to retain within the city many citizens who would otherwise move to the suburbs. The retention of the citizenship of a greater proportion of this class of its business men is of great importance, not only as regards the city's taxable values, but also as regards civic interest and civic leadership.

CHAPTER V—HEIGHT DISTRICTS

The districting resolution herewith submitted, together with the accompanying height district maps, provide for five classes of height districts limiting the height of the building at the street line to a varying multiple of the street width. The districts named in accordance with the multiple applied are: one times districts, one and one-quarter times districts, one and one-half times districts, two times districts and two and one-half times districts.

In limiting the height of all buildings in relation to the width of the streets on which they abut, the Commission has adopted a principle which for a great many years (since 1885) has been applied to tenement house construction in New York City. The Tenement House Law limits the height of tenement houses throughout the city to one and one-half times the street width. It has also been extensively applied in European cities. This rule has evident advantages over a flat limitation that operates without regard to the width of the street. A height limit based on street width is seen to have a direct relation to street congestion and to light and air conditions.

The Commission has modified the strict application of the multiple of street width rule by providing that for the purpose of computing the limiting height on the multiple of street width basis a street less than 50 feet wide shall be considered to be 50 feet wide, and a street more than 100 feet wide shall be considered to be but 100 feet wide. In other words, the multiple of street width rule is not applied to very narrow streets, nor is it applied to streets of more than a prescribed width. There is for each district a minimum height that will be permitted and a maximum height that may not be exceeded, regardless of the width of the street. This modification is customary in building height regulations based in general upon street width. It is clear that a general multiple if applied to all narrow streets in the business center might seriously interfere with an appropriate and reasonable use of the land. On the other hand if the general street width multiple were applied without limit to very wide streets and open spaces, it would result in an excessive and inappropriate height for a few buildings that would be a serious injury to the light of the neighbors on the sides and in the rear. Moreover, in the interest of safety in case of fire and of the prevention of street congestion in the side streets, it is appropriate that a maximum height at the street line be established for each district.

The multiple of street width rule limits the height of a building at the street line only. Above such height limit at the street line, the building may be carried higher by means of mansards or vertical walls provided such extended portion is set back in a prescribed ratio. In the one times district the setback rule is one foot horizontally for each two feet of height above the prescribed height limit at the street line. Similarly in the one and one-

quarter times district the setback rule is one to two and one-half; in the one and one-half times district 1 to 3; in the two times district 1 to 4 and in the two and one-half times district 1 to 5. This secures, except for streets less than 50 feet or more than 100 feet in width, a constant ratio between the height of the street wall at any point and its distance from the center of the street at such height. In other words, no part of the building may be carried above a plane formed by the intersection of a horizontal line through the center of the street and a line at right angles thereto drawn through the limiting height at the street line. This will permit greater freedom of building construction than a flat limitation of height and at the same time will preserve a uniform angle of light down into the center of the street.

At the intersection of a narrower with a wider street the height limit on the wider street governs for 100 feet back on the narrower street if such narrower street is not more than 60 feet wide.[1] For each one foot by which such narrower street exceeds 60 feet the influence of the height limit on the wider street extends one and one-half feet further back on the narrower street. Thus, if the narrower street is 80 feet wide the height limit of the wider street will extend back 130 feet on such 80-foot street. This will apply to all buildings within the 130-foot stretch whether they front on the wider or the narrower street. The distance back on the side street that the height limit of the wider street should go depends on light conditions on the narrower street as influenced by its intersection with the wider street and by the width of such narrower street as compared with that of the wider street. Both of these factors are taken into consideration in the rule applied.

As an exception to the general height and setback rule special regulations are provided for dormers and towers. Above the height limit on the street line dormers and head-houses may, with the approval of the building superintendent, be erected on the street line provided their aggregate frontage length on the street line be not greater than 60 per cent. of the street frontage and provided that such percentage shall be reduced by one for every foot of height above the height limit on the street line. This will permit the erection of one large dormer or a number of small dormers in a mansard above the height limit on the street line. On a 100-foot frontage this will mean that the dormer on the street line at the height limit can be 60 feet wide; but at a height of 10 feet above the height limit the dormer can be only 50 feet wide; at 20 feet, 40 feet wide and so on until at 60 feet of height the width of the dormer is reduced to a point. (See Figure 144.) It is also provided that the percentage of the total frontage to be devoted to dormers may be increased by one for each four inches that such dormers are set back from the street line.[2] On a 100-foot frontage this will

[1] This proposed rule is modified in important particulars by sec. 9, par. (b) of the Resolution of July 16, 1916. See page 237.

[2] This proposed additional percentage allowance is omitted in the Resolution adopted. See sec. 9, par. (c), page 237.

permit a dormer set back 5 feet from the street line to occupy 75 feet at its base and to come to a point 75 feet above the height limit at the street line. This rule will weave in with the general set-back provisions and whichever are less drastic in any particular case will govern.

If the area of a building is reduced so that above a certain level it covers only 25 per cent. of the area of the lot, a street wall above such level may be carried to any height provided it is distant 75 feet from the center of the street; but for every one per cent of its full possible length that such street wall is decreased, it may come 4 inches nearer to the center of the street. This will permit a building on an interior lot facing a street or open space of 150 feet or more in width to build a tower across the whole front of the building provided it does not cover more than 25 per cent. of the lot. Similarly on a street 100 feet wide a tower can be built across the whole front of the building provided it sets back 25 feet from the street line. Or if a building has a 200-foot frontage on a 100-foot street, a tower with a 50-foot frontage can be built on the street line. If a building is on a corner each street wall of the tower is governed by the width of the street on which it faces. A tower on the corner of a 150-foot street and a 60-foot street would have to set back 45 feet from the 60-foot street line. If, however, the tower frontage on the 60-foot street were only one-quarter of the total building frontage on such street the tower could be erected within 20 feet of the street line. This exception in favor of towers applies to street walls only and other walls of the tower must conform to the general yard and court provisions wherever applicable. (See Figure 146.)

Where a building would be pocketed between buildings in excess of the prescribed height within 50 feet on either side or directly across the street, its height may be increased by the average excess height of such surrounding buildings. This will permit a building thus pocketed to secure a fair portion of the light and air that would otherwise be monopolized by the buildings already erected. (See Figures 147, 148.)

The only district in which a height of two and one-half times the street width is proposed is in the office and financial section in lower Manhattan.[1] A height of two times the street width is allowed for the remaining portions of the more intensively developed commercial and industrial sections in a broad belt through the center of the Island from the lower office and financial section to 59th Street. An exception is made for a portion of the Fifth Avenue section where limits of one and one-quarter and one and one-half times the street width are proposed. A height of two times the street width is also allowed for a narrow belt along a large portion of the waterfront of Manhattan and along the East River waterfront of Brooklyn, Queens and The Bronx; also for a small area around the chief office and business center of Brooklyn. In the two-times districts on a 60-foot street the building can go up to 120 feet or about 10 stories at the street line and

[1] The Resolution adopted July 25, 1916, also creates a small two-and-one-half times district on the Brooklyn waterfront.

above that height by setting back 12 feet can go 4 stories higher. On a 100-foot street the building can go up 200 feet, or about 16 stories at the street line, and above that height with a 12-foot set back can go 4 stories higher.

The high building problem in lower Manhattan was carefully studied by the Heights of Buildings Commission. The existing conditions and the reasons for limitation are stated by that Commission in part as follows:

> "The high building problem is at present confined chiefly to a comparatively small portion of the lower half of the island of Manhattan. The average building height in the Borough of Manhattan is 4.8 stories. Ninety per cent of the buildings do not exceed a height of 6 stories. The buildings over 10 stories in height constitute only a little over one per cent of the total. Out of a total of 92,749 buildings, there are but 1,048 buildings over 10 stories in height; 90 buildings over 17 stories; 51 buildings over 20 stories, and only 9 buildings over 30 stories.
>
> "The Building Code requires that all buildings over 150 feet in height be thoroughly fireproof. The buildings themselves cannot burn because there is nothing combustible in their construction. All high buildings are equipped with standpipes and ample tanks at various levels and many of them with automatic sprinklers. Doors and windows between rooms and between rooms and corridors are fireproof so that fire can be confined to a single room. There are many interesting examples of such fires.
>
> "The fact remains, however, that tall buildings are not necessarily safe. The rooms are often filled with highly inflammable material. Unless doors are closed, fire may easily spread to other rooms. The draft up the chimney-like elevator wells may pull the flames across the corridor, and the flames, fed by the grease on the elevator guides, may be carried to upper floors. Under such conditions the danger of panic among the employees of the building would be very real, and the higher the building the greater the danger.
>
> "The fire department cannot fight a fire from the outside more than 85 to 100 feet above the ground. Above that they must rely on the standpipes in the building. If the standpipe does not work, or if the fire is so near the standpipe as to render its use impracticable, the fire department becomes helpless. No fatal fire in a modern high building has yet occurred, but it is not an impossibility.
>
> "In case of general panic or catastrophe causing the occupants of all offices in all buildings in the high building district to seek the streets at once, a serious situation would present itself. It would be impossible for all the occupants of all the buildings abutting on certain streets to move in the street at one time, even though the street were cleared of all other traffic, pedestrian, vehicular and surface car, and absolutely free from all obstructions so that the entire

width of the street might be used. The minimum space required by a crowd moving in one direction is five square feet per person. Computed in this manner, Broadway could hold but 96.3 per cent of its occupants; Trinity Place and Church Street 86.6 per cent; Nassau Street 69.3 per cent; New Street 44.5 per cent, and Exchange Place only 37.5 per cent. This being the situation to-day, the question arises as to what might happen in case of a general panic should the entire district be solidly built up with buildings of the present extreme heights.

"In areas where high buildings are crowded together most of the rooms even on the street front are inadequately lighted and many are decidedly dark. On New Street and Exchange Place, where the office buildings range from 10 to 22 stories high, on a bright sunny day at noon in midsummer it was found that in almost all of the street rooms artificial light was being used next to the windows. The conditions in the interior courts in parts of the tall building district are even worse.

"Even with modern artificial lighting of the most approved type, the dark offices have caused a great deal of eye strain. Nothing but adequate natural light seems to prevent it. Tuberculosis experts testified to the Commission that they had found many cases of tuberculosis directly traceable to working in dark offices. A noticeable increase in sick leave has been found among the employees of firms that have moved from light to dark offices.

"A number of streets in the high building district are already so congested that pedestrian and vehicular traffic is greatly impeded. Assuming that pedestrians will use sidewalk space only and will move in one direction only, there is room on Trinity Place and Church Street for but 56 per cent of the occupants of the buildings located on those streets; on Broadway, 50 per cent; on Nassau Street, 32 per cent, and on New Street, but 19 per cent. If these same streets should be uniformly built up to an average height of 30 stories, the above percentages would be reduced to 26 per cent on Broadway; 20 per cent on Trinity Place and Church Street; 11.9 per cent on Nassau Street; 8.9 per cent on New Street, and 8.4 per cent on Exchange Place. It is quite clear that under such conditions the street capacity would be entirely inadequate to take care of the morning, afternoon and noon hour crowds."

Chief Engineer Lewis in his testimony before the Commission spoke of the possible fatal consequences from panic in congested lower Manhattan. Mr. Lewis said: "It is obvious to anyone that in certain portions of the city, notably in lower Manhattan, the enormous day population of the office buildings, most of whom come to their work in the morning and leave in the afternoon within a very limited time, now overtaxes the public streets and, while we are reasonably free from earthquake shocks, or even tremors,

you will recall that in 1884 and again in 1886 there were violent vibrations which caused a very panicky feeling. You may remember the explosion in the Tarrant Building, perhaps twenty years ago, which created a great panic in the neighborhood. It is easy to see what would happen if, in the office building district down-town, a violent explosion or earthquake tremor were to occur, which would result in a mad rush from office buildings to the streets. The panic in the streets would be almost inconceivable, and would, under existing conditions, be about as serious and fatal in its results as those which occur when people try to leave a theatre in case of an alarm of fire."

Tenement and apartment houses throughout the city are now limited to a height of 1½ times the street width. The proposed plan takes the 1½-times rule of the Tenement House Law and applies it to substantially all the residential portions of the city that are now intensively built up and to all the commercial, industrial and waterfront sections not included in the 2½ or 2 times rule and where a somewhat intensive future development is anticipated. (See Figure 141.)

Other residential sections where a fairly intensive apartment house development seems not inappropriate, are placed in the 1¼-times district. This will permit a 6-story elevator apartment on the ordinary 60-foot street and a 10-story apartment on a 100-foot street. By taking advantage of the set-back provisions, two or more stories of additional height may be secured. Under the 1½-times rule of the Tenement House Law 9-story apartments are now built in certain sections of Manhattan on the 60-foot streets. The 1¼ districts will prevent the development of this type, and this will be a distinct gain from the point of view of better light and air and the distribution of population.

All other portions of the city, including those in which a 2, 3, 4 or 5 story development seems appropriate, are placed in the one-times district. This will permit of a 5-story building on a 60-foot street and an 8 or 9 story building on a 100-foot street. By taking advantage of the set-back provisions, one or more stories of additional height may be secured.

CHAPTER VI—AREA DISTRICTS

The districting resolution herewith submitted, together with the accompanying area district maps provide for five classes of area districts, A, B, C, D and E, with varying regulations as to size of yards, courts and other open spaces.

Except in A districts, any building that is back to back with the rear of another property and is more than 55 feet back from the nearest street must have a rear yard. The requirement for a rear yard is reciprocal. No building is required to have a rear yard unless a similar obligation could be imposed with respect to any building hereafter erected on the plot immediately behind such yard. The 55-foot exemption is inserted on the assumption that a building running back but 55 feet from the street can be lighted in its most used parts directly from the street. A corner building is seldom back to back with the rear portion of another building and consequently would seldom require a rear yard.[1] (See Figure 156.) If, however, a building runs through the middle of a block from street to street and between lots for which rear yards are required it will be required to leave uncovered in some part of its extent courts equivalent in size to the space that its neighbors are required to devote to rear yards.[2] (See Figure 157.) The depth of the rear yard at its lowest level must be at least 10 per cent. of the depth of the lot, but need not in any case exceed 10 feet at such level. For any building not within a residence district the rear yard may start from a level 18 feet[3] above the curb. This permits all buildings in the business, unrestricted and undetermined districts to cover the entire lot for the first floor. For any building in a residence district the rear yard must start from the curb level, except that the usual one-story accessory buildings may cover 40 per cent. of the prescribed area of the yard.

In addition to the percentage requirement as to the depth of the yard at its lowest level, the yard must increase in depth with the height of the yard being not less than one inch, two inches, three inches, four inches or five inches in depth for each one foot of its height, according as it is located in the A, B, C, D or E district. The increased depth of yard required as the building increases in height may be secured by stepping back at each story or at each two, three, five or more stories. The purpose of the regulation is to preserve a reasonable angle of light for the lighting of the lower windows.

In every building hereafter constructed in which a room in which persons live, sleep or work receives its light and air in whole or in part from a court or yard, at least one court or yard having a window opening from such room shall be of the size prescribed for a required court. The least

[1] Under the Resolution of July 25, 1916, a corner building is specifically exempted from the rear yard provision. See sec. 16, par. (a), page 240.

[2] Modified by Resolution of July 25, 1916. See sec. 16, par. (d).

[3] 23 feet in Resolution of July 25, 1916. See sec. 16, par. (b).

Broadway — Looking North from Trinity Church.

Park Row at Frankfort Street.

Broadway — Looking South from Trinity Church.

Broadway — Looking north from the Post Office.

FIG. 21—TALL BUILDINGS OVERTAX STREET CAPACITY.

The multiplication of floor area by the erection of very high buildings soon overtaxes streets which were designed for buildings of less height. Besides the usual dangers of congestion the possibility of panic is increased and the movement of fire apparatus made slow and difficult.

horizontal dimension of a required court shall be not less than four feet. The court must increase in width with the height of its enclosing walls, being not less than one inch in least dimension for one foot of height, in an A or B district, one and one-half inches in a C district, two inches in a D district and two and one-half inches in an E district. This gives an outer court with a least dimension at any height just one-half as great as that for a required yard at the same height. The area of an inner court at any height must be not less than the square of the depth of a required yard at such height. The length of such required inner court for its minimum area may not be more than twice its width. (See Figure 152.) The width of an outer court besides being governed by the height of such court is also governed by the length of the court. An outer court gets its light and air both from above and from the end of such court opening on the yard or street. It is appropriate therefore that the width of the outer court should bear some relation to its length. An outer court accordingly must increase in width with the length of such court being not less than one inch in least dimension for each foot of length from the closed end in an A district, one and one-half inches in a B or C district, two inches in a D district and two and one-half inches in an E district.

The A district is essentially a warehouse district and is confined to a narrow belt along the navigable waterfront and along the rail terminals. Light is not required for most storage buildings. The A district is established so that storage buildings that do not require light and air will not need to provide unnecessary open spaces. The Districting plan makes it possible to give such buildings a place to locate where they will be exempt from all yard requirements. Any building in an A district, however, that is required to have a court to light its workrooms must provide courts of at least one inch in least dimension for each foot of height, as now provided in the Building Code. This does not mean that a building covering the entire plot may not be located outside of an A district, for in a B, C or D district a department store, for example, not back to back with another building and with no rooms that have to face on a legal court, could occupy 100 per cent of the lot for its entire height.

In a B district rear yards must be at least two inches in least dimension for each one foot of height, and outer courts and side yards at least one inch in least dimension for each one foot of height. This will require for all buildings slightly deeper yards above 90 feet in height than are now required under the Tenement House Law. This will only affect elevator apartments above eight or nine stories in height fronting on the long side of blocks, and the increased width of yard will not have to be carried down to the ground, but can be provided in a set back above the 90-foot limit. In the B districts the important change, as compared with existing conditions, is the requirement of a rear yard for business and industrial buildings as well as tenements wherever they are back to back with the rear of another property. The rear yard for a building 120 feet high or about

10 stories would be 20 feet in depth, and for a building 150 feet high, or about 12 stories, would be 25 feet in depth. This is not in excess of the best economic standards and practice, and will greatly improve light and air conditions in the loft building and office building sections of the city. In case the yard started 18[1] feet above the curb, as permitted for buildings not in residence districts, the width of the yard at any height above the curb would be three feet less than indicated in the above examples. (See Figure 151.)

In the C districts rear yards for all buildings must be at least three inches in least dimension for each foot of height and outer courts and side yards must be at least one and one-half inches in least dimension for each one foot of height. The prescribed minimum size of yards and courts remain about the same as under the Tenement House Law up to and including five stories in height. Above that height, however, they gradually become more stringent than under the Tenement House Law. In a building five stories, or approximately 56 feet in height, a rear yard under these provisions would have to be 14 feet wide, or two feet wider than required under the Tenement House Law. An outer court would have to be seven feet wide, or one foot wider than required under the Tenement House Law. However, as buildings on interior lots are limited to 70 per cent of the lot under the Tenement House Law, this is apt to require increases in the minimum depths and widths of courts and yards, and for most floor plans and plots a five-story tenement house covering 70 per cent of the lot could be built under the C district regulations. On account of difficulties in planning suitable buildings for small plottages a special exception is made in the court requirements for a lot 30 feet or less in width. On such lots outer and inner courts are subject to the regulations provided for such courts in the B districts. (See Figure 153.)

For all buildings in a D district rear yards must be four inches in least dimension for each one foot of height and courts and side yards two inches in least dimension for one foot of height. A building on an interior lot in a residence district may not cover more than 60 per cent of the area of the lot; on a corner lot it may cover 80 per cent of such area. In a residence district the depth of a rear yard at the curb level shall be 20 per cent of the depth of the lot, but need not exceed 20 feet at such level. The restrictions provided for the D districts are especially appropriate for one and two-family house districts, especially where houses occur in rows. They are also appropriate for multi-family houses, provided they are built with more adequate courts and open spaces than is now customary. The minimum dimensions of yards and courts are double those required for buildings in the B districts. A tenement or an apartment house on an interior lot in a D district covering 60 per cent of its lot, four stories, or 44 feet in height, would have to have a yard 20 feet deep and an outer court at least seven feet four inches wide. For lots of 30 feet or less in

[1] 23 feet in Resolution of July 25, 1916. See sect. 16, par. b.

width outer and inner courts are subject to the less restrictive regulations provided for such courts in C districts. (See Figure 154.)

The E district regulations are particularly appropriate for detached or semi-detached houses on lots 40 feet or more in width. In a residence district a building on an interior lot with its porches, wings and accessory buildings may not occupy for the first story more than 50 per cent of the area of the lot, and may not exceed 30 per cent of the area of the lot above the first story. For a corner lot these percentages are increased to 70 per cent and 40 per cent respectively. For all buildings rear yards shall be at least five inches in least dimension for each one foot of height and courts and side yards at least two and one-half inches for each foot of height. For a lot 50 feet or less in width courts and side yards shall be not less than two inches in least dimension for each foot of height. In a residence district the depth of the rear yard at the curb level shall be at least 25 per cent of the depth of the lot, but need not exceed 25 feet. If the building is set back from the street the required depth of the rear yard may be correspondingly decreased, but not below ten feet. On at least one side of every building in a residence district there shall be a side yard along the lot line for the full depth of the lot. For any building not within a residence district the depth of the required rear yard at its lowest level must be at least 15 per cent of the depth of the lot, but need not exceed 15 feet at such level. (See Figure 155.)

It is so important to secure some segregated open space for the joint play and recreational use of the residents of every section that is built up with tenement or apartment houses that it is well worth while to grant developers the option of building under less restrictive provisions as to courts and yards if as a substitute they supply areas suitable for recreational use. An arrangement is accordingly provided whereby an individual developer or group of property owners in a D or C district can by setting aside 10 per cent of their land for joint recreational use, be relieved of the court and yard requirements of the district in which they are situated and have the right to follow the requirements of the next less restricted district. The 10 per cent set aside for common recreational use must be equal to at least 5,000 square feet and must be at least 40 feet in its least dimension. This common space may be left in the center of the block or it may be made up of any lots in the block or in an adjoining block that are approved by the superintendent of buildings[1] as suitable for the joint recreational use of the residents.

[1] Changed to Board of Appeals in Resolution of July 25. See sec. 13, par. (b) and sec. 14, par. (d).

CHAPTER VII—FUTURE CHANGE AND DEVELOPMENT OF DISTRICTING PLAN

The Legislature by a recent amendment to the districting provisions of the Charter (sections 242a, 242b) has provided a definite method, under appropriate safeguards, by which the Board of Estimate may amend and supplement any general districting plan that it may adopt. This amendment was drafted by the Commission and approved by the Board of Estimate. It is essential to the success and future development of any districting plan.

The districting plan submitted has been evolved after a careful study of existing conditions and tendencies and a careful estimate of probable future needs and requirements, both of the city as a whole and of each particular section. There is no thought, however, that the plan now proposed can be complete and final for all time. There are doubtless errors and omissions that will be brought out only by actual operation. Moreover it is recognized that any plan of city building must be modified and supplemented with the growth of the city and the changes in social and economic conditions due to the progress of invention and discovery.

"No limit can be set to the growth and expansion of the city. No amount of planning can avoid the necessity for a considerable amount of reconstruction and change. Regardless of the requirements of an increasing population, the city structure must change to conform to the changes in the economic and industrial world. The city is but an expression of the existing economic, commercial, industrial, social and political organization. When invention and discovery are changing the methods of work and of living throughout the world, it is idle to think that we can so judge the future that our present plans for the city's development will not require change and modification. The 'once for all' method of city planning is therefore impractical. We cannot adopt a plan and make that the Procrustean mold for all future time. The plan must develop and change with the advance of civilization. City planning to be effectual must be sustained and continuous. It is never completed." [1]

Even now it is clear that the present plan must be supplemented and changed when plans for certain fundamental factors affecting the physical structure of the city have been definitely worked out. Among these factors are, a comprehensive plan of port and terminal development, a plan of park development in Brooklyn, Queens and Richmond, a plan for future extensions and surface line feeders for the dual subway system.

Moreover the present plan has been developed along quite broad general lines with the belief that after its adoption it would be further supplemented by more restrictive provisions in various areas. A more intensive

[1] Robert H. Whitten, in Development and Present Status of City Planning in New York City, p. 18.

East 23rd Street, between Avenue D and Clarendon Road, Flatbush — Apartment house in private house district.

Fifth Avenue, corner 74th Street—Private house making way for 12-story apartment house.

East 19th Street, near Cortelyou Road, Flatbush—Apartment house in exclusive private house district.

Beverly Road and East 18th Street, Flatbush—Apartment house extends to the street line in private house district.

FIG. 22—THE APARTMENT HOUSE INVADING DETACHED HOUSE SECTIONS.

Even as apartment districts are invaded by business so is the high-class private detached house district invaded by occasional tenements which cut off light and depress values for private residence purposes. In districts designated "E" on the Area maps, the erection of apartment houses will be discouraged by the requirement that a large percentage of the lot be left unoccupied.

study of particular sections will doubtless show that some streets now unrestricted or restricted to business may with advantage be included in the residence class. The owners interested will doubtless in many cases petition that this be done. Similarly and even to a greater extent the area districts contained in the present plan will be supplemented in order to conserve existing developments and extend the safeguard of the E and D restrictions to other sections.

The method of amendment contained in the proposed districting resolution is as follows: "Whenever the owners of 50 per cent or more of the frontage in any district or part thereof shall present a petition duly signed and acknowledged to the Board of Estimate and Apportionment requesting an amendment, supplement, change or repeal of the regulations prescribed for such district or part thereof, it shall be the duty of this Board to vote upon said petition within 90 days after the filing of the same by the petitioners with the Secretary of this Board. If, however, a protest against such amendment, supplement or change be presented, duly signed and acknowledged by the owners of 20 per cent or more of the frontage proposed to be altered, or by the owners of 20 per cent of the frontage immediately in the rear thereof, or by the owners of 20 per cent of the frontage directly opposite the frontage proposed to be altered, such amendment shall not be passed except by the unanimous vote of the Board."

The above provisions in relation to a protest of 20 per cent. of frontage affected are identical with the provisions for amendment added by the recent Legislature to the districting sections of the Charter. Under this method it will be possible for the owners in any block frontage between two intersecting streets to petition for the kind of restriction that will best conserve the type of improvement most suitable for that block. We believe that this process of amending, supplementing and perfecting the general plan is essential to its full success.

Under the districting resolution submitted the enforcement of the plan is vested in the superintendent of buildings in each borough, the fire commissioner and the tenement house commissioner under the rules and regulations of the Board of Standards and Appeals. The chief control will be exercised through the building permit and the certificate of occupancy issued by the superintendent of buildings. The fire commissioner's jurisdiction will be confined to subsequent enforcement of provisions in relation to the use of buildings. The tenement house commissioner will have jurisdiction over the application of the provisions of the resolution to tenement houses.

The future amendment and development of the districting plan will doubtless entail some added work for the Board of Estimate. It should be carried on as part of the general work of comprehensive planning that the Board's Committee on the City Plan has in hand. It is very important for the permanent success of the districting plan that all detailed amend-

ments should be correlated with a comprehensive plan of city growth and development.

Respectfully submitted,

COMMISSION ON BUILDING DISTRICTS
AND RESTRICTIONS,

EDWARD M. BASSETT, *Chairman,*
LAWSON PURDY, *Vice-Chairman,*
EDWARD C. BLUM,
JAMES E. CLONIN,
OTTO M. EIDLITZ,
BURT L. FENNER,
EDWARD R. HARDY,
RICHARD W. LAWRENCE,
ALRICK H. MAN,
ALFRED E. MARLING,
GEORGE T. MORTIMER,
J. F. SMITH,
WALTER STABLER,
FRANKLIN S. TOMLIN,
GEORGE C. WHIPPLE,
WILLIAM G. WILLCOX.
ROBERT H. WHITTEN, *Secretary.*

APPENDIX I—CHARTER PROVISIONS

Sections 242a and 242b of Greater New York Charter, as Enacted by Chapter 470 of Laws of 1914 and Amended by Chapter 497 of Laws of 1916.

§ 242a. The board of estimate and apportionment shall have power to regulate and limit the height and bulk of buildings hereafter erected and to regulate and determine the area of yards, courts and other open spaces. The board may divide the city into districts of such number, shape and area as it may deem best suited to carry out the purposes of this section. The regulations as to the height and bulk of buildings and the area of yards, courts and other open spaces shall be uniform for each class of buildings throughout each district. The regulations in one or more districts may differ from those in other districts. Such regulations shall be designed to secure safety from fire and other dangers and to promote the public health and welfare, including, so far as conditions may permit, provision for adequate light, air and convenience of access. The board shall pay reasonable regard to the character of buildings erected in each district, the value of the land and the use to which it may be put to the end that such regulations may promote public health, safety and welfare and the most desirable use for which the land of each district may be adapted and may tend to conserve the value of buildings and enhance the value of land throughout the city. The board shall appoint a commission to recommend the boundaries of districts and appropriate regulations to be enforced therein. Such commission shall make a tentative report and hold public hearings thereon at such times and places as said board shall require before submitting its final report. Said board shall not determine the boundaries of any district nor impose any regulation until after the final report of a commission so appointed. After such final report said board shall afford persons interested an opportunity to be heard at a time and place to be specified in a notice of hearing to be published for ten consecutive days in the City Record. The board may from time to time after public notice and hearing amend, supplement or change said regulations or districts, but in case a protest against a proposed amendment, supplement or change be presented, duly signed and acknowledged by the owners of twenty per centum or more of the frontage proposed to be altered, or by the owners of twenty per centum of the frontage immediately in the rear thereof, or by the owners of twenty per centum of the frontage directly opposite the frontage proposed to be altered, such amendment shall not be passed except by a unanimous vote of the board.

§ 242b. The board of estimate and apportionment may regulate and restrict the location of trades and industries and the location of buildings designed for specified uses, and may divide the city into districts of such number, shape and area as it may deem best suited to carry out the purposes of this section. For each such district regulations may be imposed designat-

ing the trades and industries that shall be excluded or subjected to special regulations and designating the uses for which buildings may not be erected or altered. Such regulations shall be designed to promote the public health, safety and general welfare. The board shall give reasonable consideration, among other things to the character of the district, its peculiar suitability for particular uses, the conservation of property values, and the direction of building development in accord with a well-considered plan. The board shall appoint a commission to recommend the boundaries of districts and appropriate regulations and restrictions to be imposed therein. Such commission shall make a tentative report and hold public hearings thereon before submitting its final report at such time as said board shall require. Said board shall not determine the boundaries of any district nor impose any regulations or restrictions until after the final report of a commission so appointed. After such final report said board shall afford persons interested an opportunity to be heard at a time and place to be specified in a notice of hearing to be published for ten consecutive days in the City Record. The board may from time to time after public notice and hearing amend, supplement or change said regulations or districts, but in case a protest against a proposed amendment, supplement or change be presented, duly signed and acknowledged by the owners of twenty per centum or more of the frontage proposed to be altered, or by the owners of twenty per centum of the frontage immediately in the rear thereof, or by the owners of twenty per centum of the frontage directly opposite the frontage proposed to be altered, such amendment shall not be passed except by a unanimous vote of the board.

PART OF MAP SHOWING CONTOURS AND STREET GRADES

1916

Contours at 20-foot intervals are shown thus..... —20—

Street grades 0% to 3% inclusive are shown thus.....

" " 3.1% " 4.9% " " " " .....

" " 5% " 9.9% " " " " .....

" " 10% and upward " " " .....

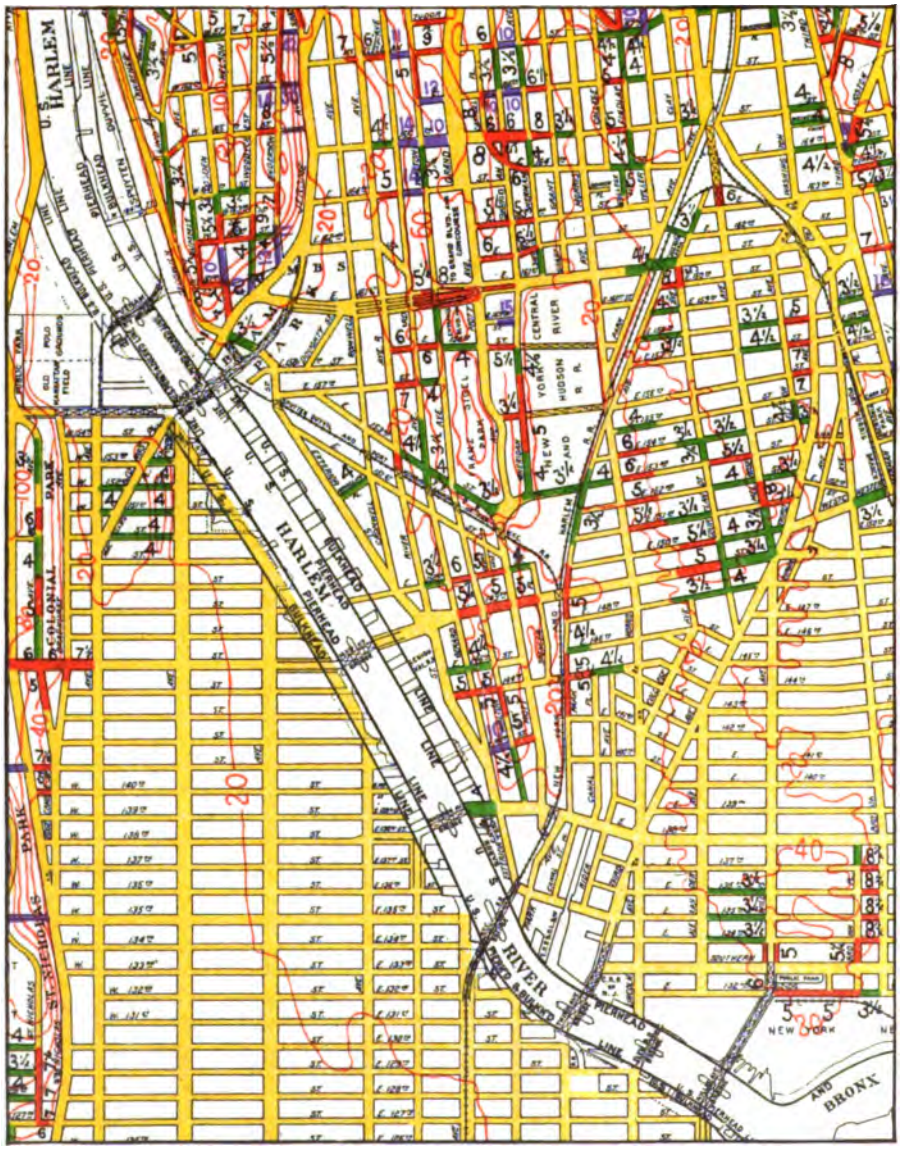


FIG. 23.

It will be seen by comparing the preceding Contour and Grade map with the Use District map below, that the lower levels near the waterfront are unrestricted and that the higher levels and steeper grades are generally in business or residence districts. The latter districts as a rule include the steepest grades and the greatest elevations; for example, the residence districts near the southerly end of the Concourse and north of McCombs Dam Park.

PART OF
USE DISTRICT MAP
FOR THE AREA SHOWN ON OPPOSITE PAGE

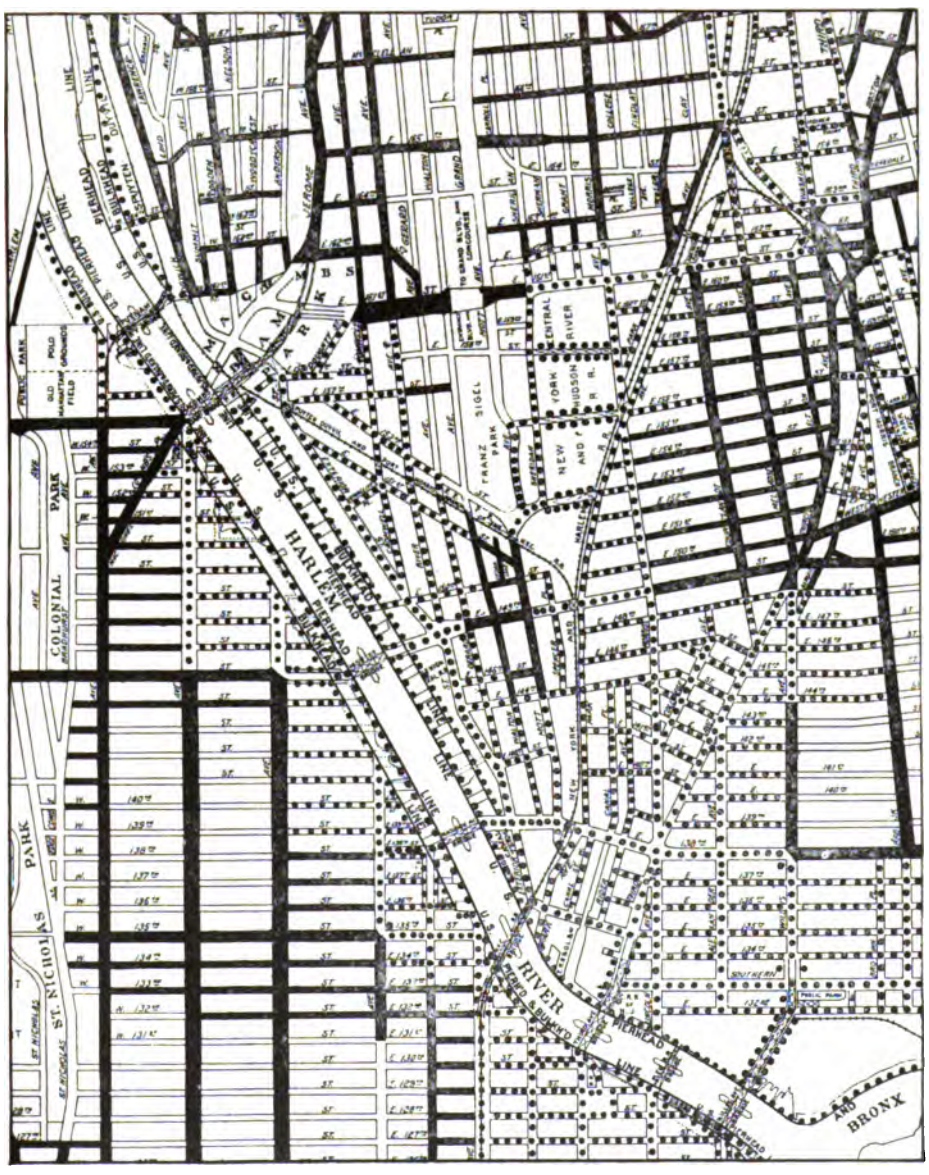


FIG. 24.

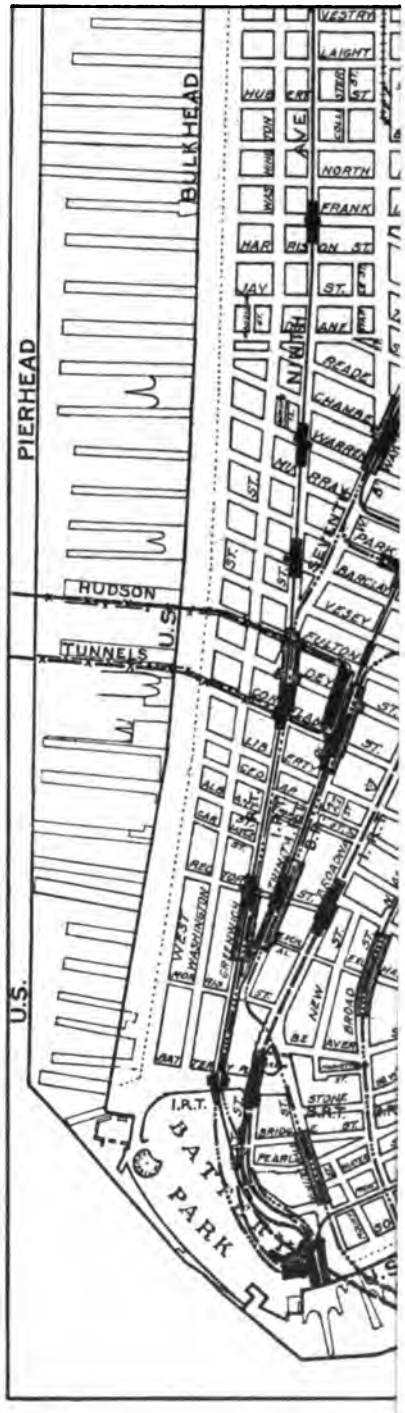


FIG. 25—EXISTING AN

APPENDIX II—THE ZONING SURVEY

The Commission directed its staff to secure all data essential to a knowledge of existing conditions and tendencies, and to an estimate of future growth and development. This data, supplemented by personal inspection on the ground, was used to assist the expert knowledge and experienced judgment of the members of the Commission in laying down the actual district boundaries and the regulations to be enforced therein.

It was essential that the data collected should be both detailed and comprehensive. There must be detailed information in relation to the buildings and physical characteristics and immediate environment of every individual block and also comprehensive or bird's eye views of the entire borough or city. The comprehensive view is indispensable to the determination of the number and characteristics of the various kinds of districts to be established and also for the determination in a general way of the logical boundaries for such districts. The detailed examination street by street and block by block is necessary to determine the exact boundaries and also to determine whether there is need for the exemption of certain small areas within the boundaries of a larger district.

Topographic features

Especially in the undeveloped areas, the existing lay of the land, the rivers, hills, valleys, marshes, highways, railroads and other physical features, give the best indication of the probable future use of the land. The topographic and hydrographic charts of the national government were used, as were also the more detailed topographic and grade maps prepared by the topographic bureaus of the boroughs. From these a map was prepared showing by colors the grade percentage in each street. Twenty-foot contour lines were also drawn covering practically the entire city with the exception of the Borough of Richmond.

A steep street grade will often mark the boundary line between different kinds of use or between different types of the same kind of use. It often serves to separate the waterfront industrial or warehouse use from a business or residential use or a business use from a residential use. A study of the grades is helpful in determining the future traffic streets and hence the future business streets. Steep grades in certain sections make it reasonably certain that they will be used for residential purposes—they are unfitted for either business or industry.

A bird's eye view of any city discloses the fact that industry of the heavier type seeks the waterfront and lower levels. Cheap transportation, and sometimes also cheap land, are the attractions that bring the heavy industries to the low levels. The railroads follow the low levels in passing through the city, and the waterfront, as the place at which rail and water transportation meets, naturally has the best terminal facilities. Low-lying

land bordering deep water constitutes in a city an almost certain dedication to future terminal and industrial use. (See Figures 6, 23 and 24.)

Rapid transit system

While the location of the rail and water terminal facilities fixes the location of industry of the heavier type, the passenger transportation system is the chief factor in determining the location of business centers and sub-centers and in determining the building up and the intensity of use of various residential districts. The rapid transit system at present in operation or under construction will necessarily determine the general lines of city growth and development for many years to come. Owing to the automobile and electric suburban railroad service, the local centers will continue to increase within a radius of 50 miles or more of New York; but the great bulk of the population of the city will continue to be housed within a five-cent fare and a 40-minute ride of the chief business center. (See Figure 25.)

A time zone transit map was carefully worked out, showing the time from every part of the city to the City Hall and to 14th Street. This time includes the time required to walk from any given location served by a transit line to the nearest station and the running time from that point to the City Hall or to 14th Street. As a rule only the five-cent fare routes are considered. Areas beyond half a mile or a ten-minute walk from a transit line are not dealt with, as a half-mile belt is considered the limit of any considerable influence of a transit line. The time zone map includes lines planned and under construction as well as those now in operation, and is based on estimated running time when the new dual subway system is in full operation. (See Figure 26.)

This time zone map was in constant requisition to assist the judgment of the Commission in its determination of the appropriate use and the appropriate intensity of use of particular areas.

Vehicular traffic

The main roads and thoroughfares are also of great importance in determining the lines of future growth and development. The main roads often fix the location of future transit lines and local business streets. To determine the relative importance of existing traffic routes, traffic counts obtained from the various boroughs were plotted on the city map. (Fig. 27.)

Distribution of population

The figures of the 1900, 1905 and 1910 censuses were charted on maps by enumeration districts. These enumeration districts in Manhattan, The Bronx and Brooklyn are generally very small areas including one or more city blocks. The 1910 figures were even more carefully analyzed and distributed within each enumeration district according to the existing housing accommodations. A spot map was then prepared with each spot representing twenty-five people. This is probably the most intensive study that has

PART OF MAP

SHOWING

MAIN TRUCKING AND AUTOMOBILE ROUTES

WITH

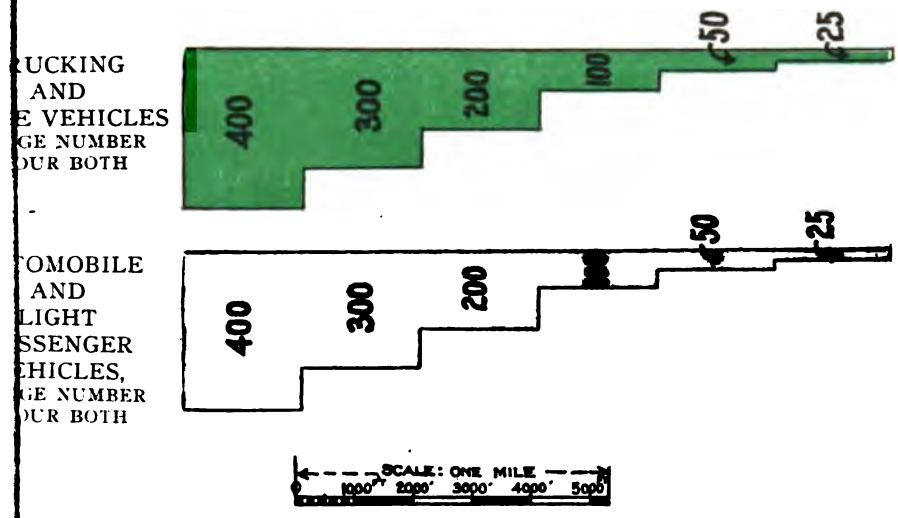
TRAFFIC COUNTS

1915

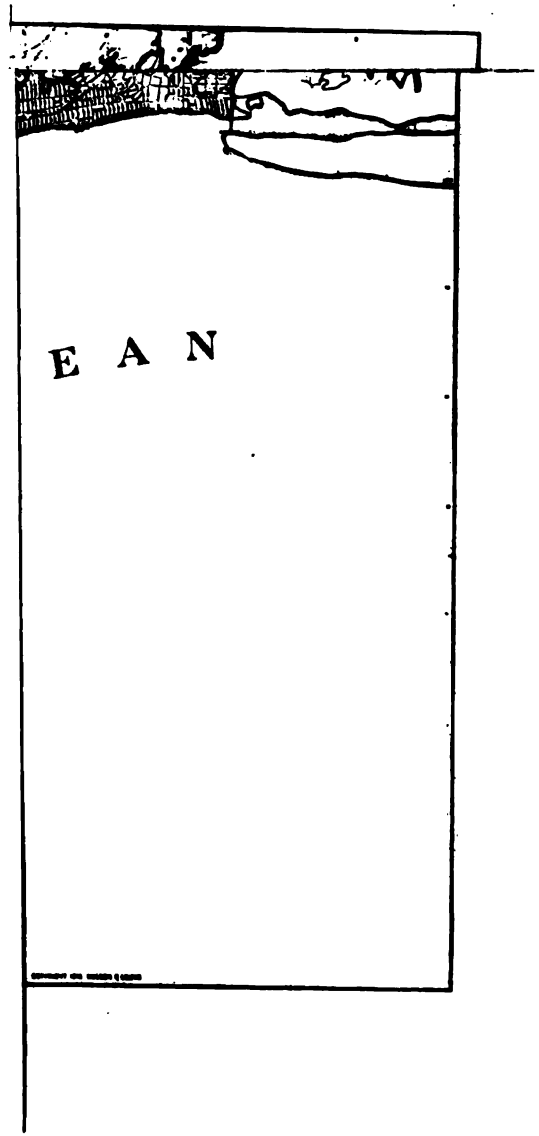
RED FIGURES ON MAP BELOW STREETS INDICATE AVERAGE NUMBER PER HOUR OF TRUCKING OR TRADE VEHICLES.

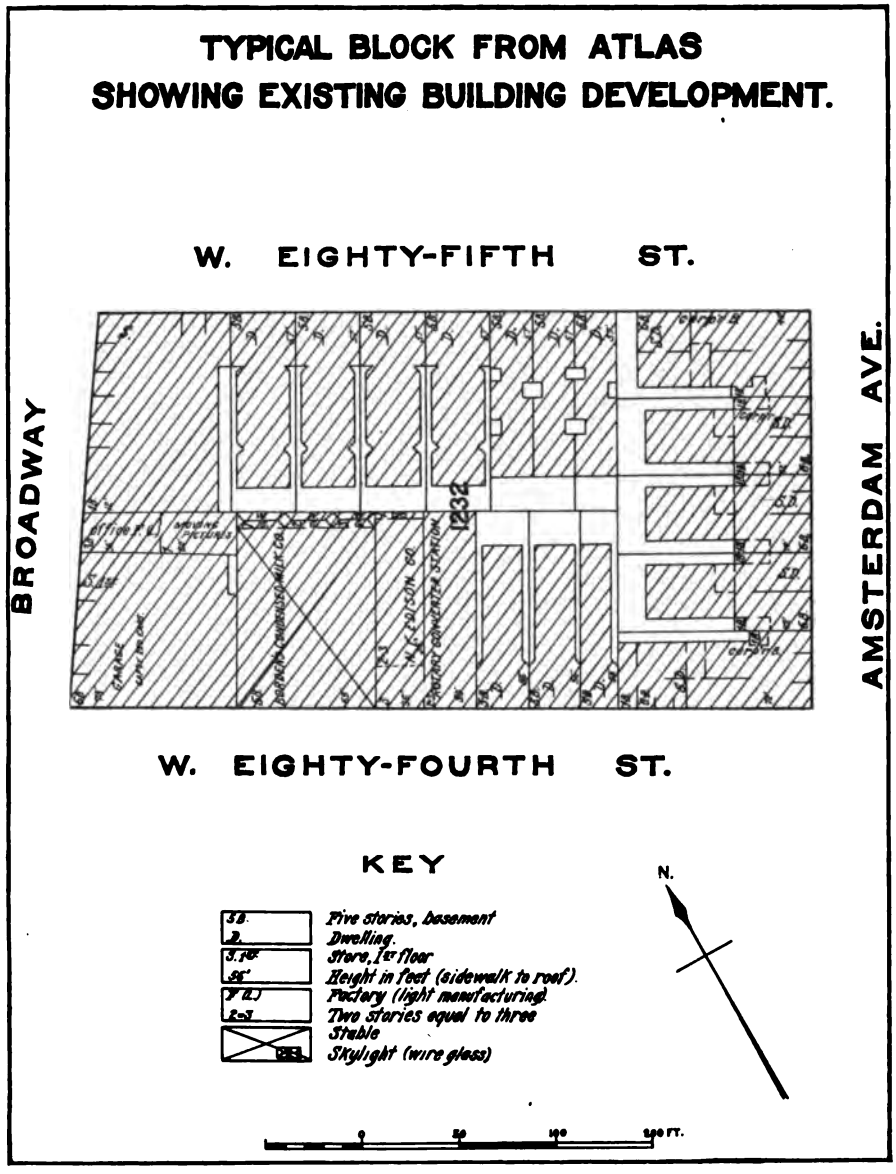
BLACK FIGURES ON MAP ABOVE STREETS INDICATE AVERAGE NUMBER PER HOUR OF AUTOMOBILES OR LIGHT PASSENGER VEHICLES.

BROKEN BLACK LINES INDICATE AUTOMOBILE ROUTES RECOMMENDED BY THE OFFICIAL AUTOMOBILE BLUE BOOK OF 1915.



Business and industry generally follow traffic routes and it will be seen that the use district maps include the traffic arteries in business or unrestricted districts. Compare with Use District Map Sections 9, 10, 13 and 14.


E A N



By Courtesy of Sanborn Map Co.

FIG. 30.

The Commission has on file atlases of all the boroughs except Richmond, which show in detail on a scale of 50 or 60 feet to an inch, the use, height, and approximate dimensions of all buildings as well as many other details concerning them. These atlases are kept up to date by frequent revision and were constantly referred to in preparing the districting maps. Only the data given in the atlases of greatest value in districting is shown above.

PART OF MAP SHOWING BUILDING AND TRANSIT DEVELOPMENT
MANHATTAN—1914

Base map by courtesy of the Ohman Map Co.

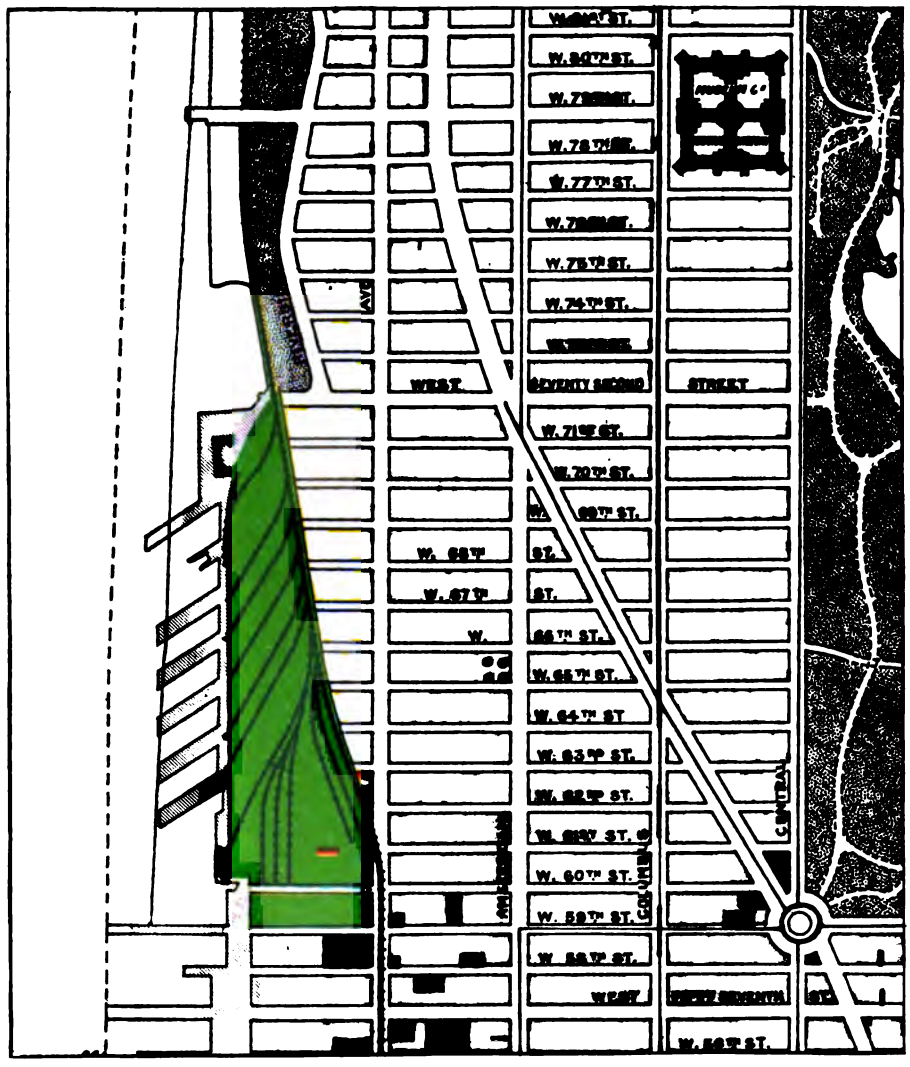
FIG. 31.

PART OF MAP SHOWING BUILDING AND TRANSIT DEVELOPMENT MANHATTAN—1885

It will be seen on referring to the Use District Map Section 8 that it provides a large business district in the vicinity of Broadway where the 1914 Development map shows that most of the business buildings are located, an unrestricted district west of Amsterdam Avenue and south of 72nd Street where there is a considerable warehouse and factory development, and residence districts west of Broadway north of West 70th Street and east of Columbus Avenue north of 66th Street, where many residences and apartment houses are located.

The 1914 and 1885 Development maps when taken together indicate the great increase in intensity of development of all kinds in the area during the last 29 years.

Note—Scale and key are the same as for the map on the opposite page except that no separate classification was made in 1885 of business on first floor; a store and dwelling is classed under residence.



Base map by courtesy of the Ohman Map Co.

FIG. 32.

been made of the distribution of the population of the city. The spot map was of great assistance in comprehending at a glance the distribution of population throughout the city and in estimating the relative effect of various kinds of transit facilities on the distribution of population. (See Figure 20.)

Supplementing the census data as to distribution of population in their places of abode, data was obtained and charted to show the distribution of factory workers in the places in which they work. At the request of the Commission, the State Labor Department compiled from its records a block census for all factory employees throughout the city according to place of work. With this data the Commission prepared a spot map of factory employees—one spot for each 250 employees. This map was valuable in laying out the unrestricted or industrial districts and in studying the existing and possible future relation between congestion of factories and congestion of population. (See Figure 7.)

The results of the police census of 1915 were plotted by census districts and the center of gravity of the population of each district obtained, and from these the center of gravity of the population of each borough. These were combined to obtain the center of gravity of the population of the entire city. This map enables one to see the relation of these several centers of population to existing business and traffic centers. (See Figure 28.)

Existing building development

The entire zone plan as proposed by the Commission is based on a frank acceptance of existing conditions. The zone plan not only does not affect the continued use of any existing building, but it ordinarily does not attempt to radically change the character of new buildings from the type with which any considerable area is at present built up. It was very important, therefore, that the Commission should have before it a detailed record of the existing building development in every part of the city. (Fig. 30.)

Distribution of buildings according to use

In order to study the location of existing residential, business and industrial buildings and areas, borough maps were prepared showing in colors industrial buildings and use, business buildings, store and dwelling buildings and residential buildings, including under the latter head schools, churches and institutional buildings. These maps enabled the Commission to determine the general boundaries of the residence, business and unrestricted districts, in so far as such boundaries could properly be based on the existing building development.

The Commission based its work, however, not entirely or chiefly on existing building development, but also upon its judgment of future growth and requirements. In order to better judge the future growth and change of the business, residence and industrial areas a careful study was made of such growth and change in the past. Based on information given in the

atlases of the various boroughs published at various intervals during the past fifty years, borough maps were prepared showing in colors the location of industrial, business and residence buildings. In order to note the effect of freight and water terminals and of improved transit facilities on the location and growth of building development, the rail and water terminals and the transit lines were carefully noted on the building development maps. These historical maps show from period to period the expansion of the built-up area of the city and the development and change of the industrial, business and residence areas. (See Figures 31 and 32.)

Distribution of existing buildings according to height and area covered

In order to aid in the determination of the number and character of the height districts to be established and the general boundaries of the various districts, so far as they would be affected by the height of existing buildings, maps were prepared showing in colors the height of each building throughout the city. Similarly, for the purpose of assisting the judgment of the Commission in laying out area districts, maps were prepared showing graphically the area covered by each building throughout the city. (See Figures 33-36.)

Land values

Comparative land values are a most important and accurate measure of differences in the kind and character of use appropriate for various areas. Values are particularly important in determining that particular intensity of use that is consistent with the most beneficial use of the land. They are, therefore, particularly useful in the determination of the boundaries of the various height and area districts.

It is fortunate for this purpose that for the past few years sectional maps have been published by the City Department of Taxes and Assessments giving the assessed value per front foot of all land throughout the city. In this case the unit of value is the value per front foot of an interior lot 100 feet in depth.

From these sectional maps a map of the entire city was prepared showing in colors the various ranges of value per front foot. This enables one to compare at a glance, e. g., values in Flatbush with values in Bay Ridge and values in The Bronx with those of Brooklyn. It also shows the blighting effect on certain sections of an invasion by inappropriate or nuisance uses. (See Figure 37.)

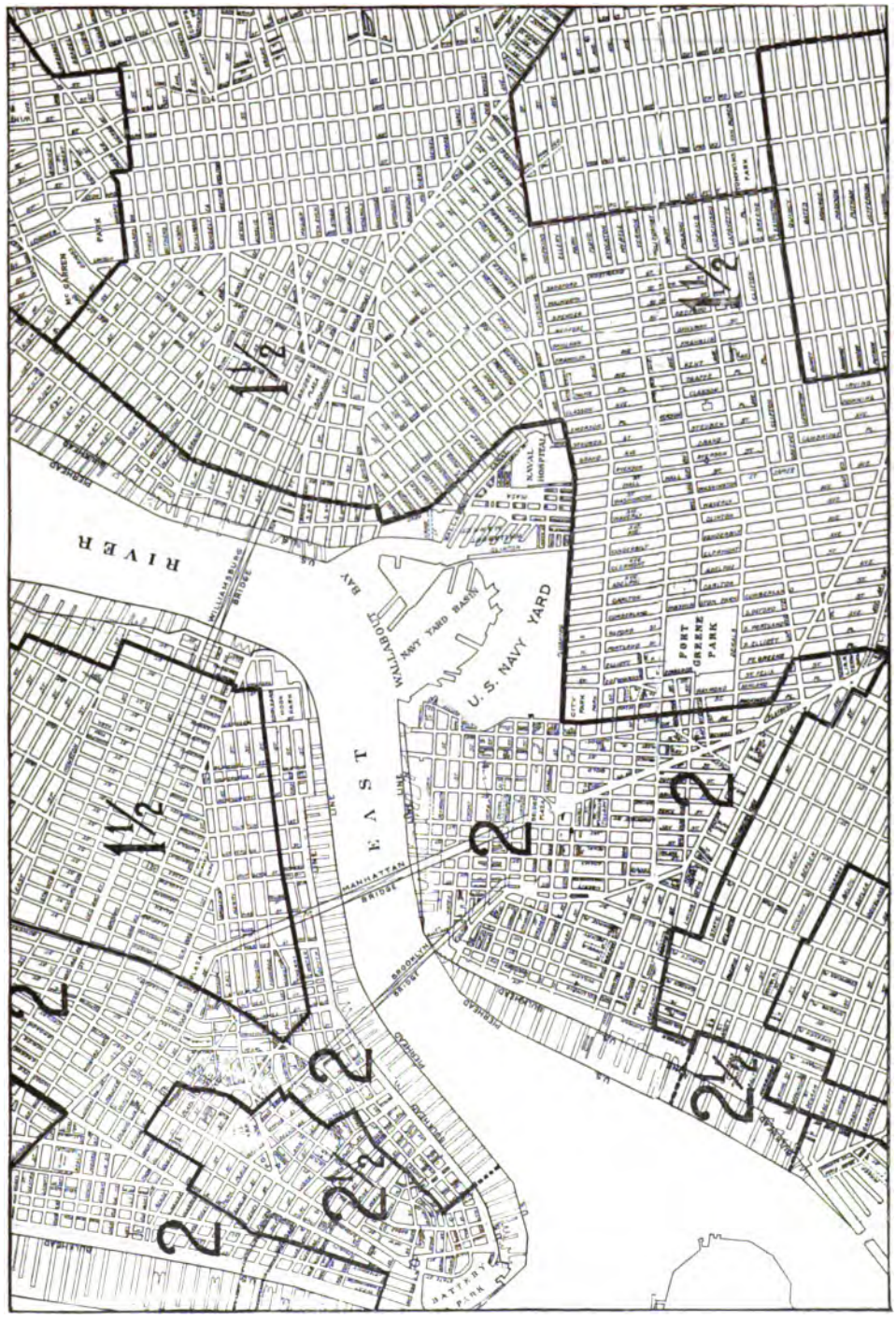


FIG. 34—HEIGHT DISTRICT MAP FOR SECTION SHOWN ON OPPOSITE FOLDER.

PART OF MAP
SHOWING
PERCENTAGE OF LOT COVERED BY EXISTING BUILDINGS
1915

Sheds and shed-like construction, usually one story, and storage yards are shown thus.....

Isolated buildings occupying up to 30 per cent. of the area of the lot are shown thus.....

Houses (usually in rows) occupying from 30 per cent. to 50 per cent. of the area of the lot are shown thus .....

Houses (usually new-law tenements) occupying from 50 per cent. to 70 per cent. of the area of the lot are shown thus.....

Buildings (in tenement house districts, usually old-law tenements and in business districts, business buildings) occupying from 70 per cent. to 90 per cent. of the area of the lot are shown thus .....

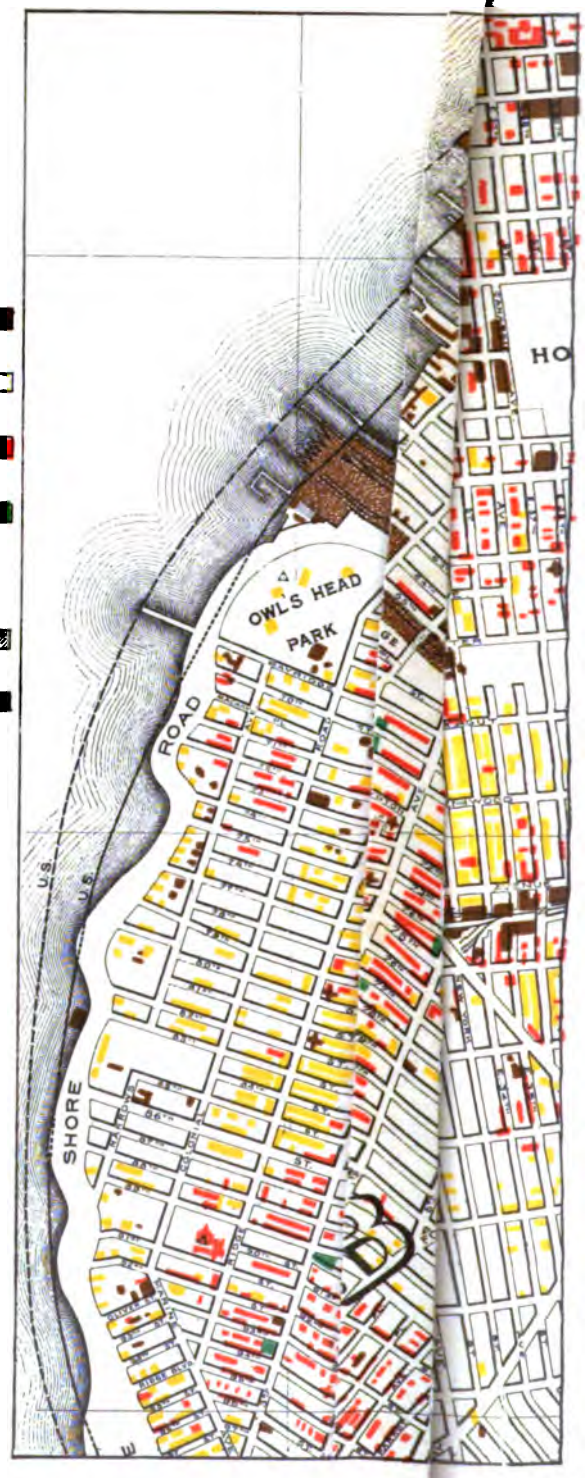
Building occupying from 90 per cent. to 100 per cent. of the area of the lot are shown thus....

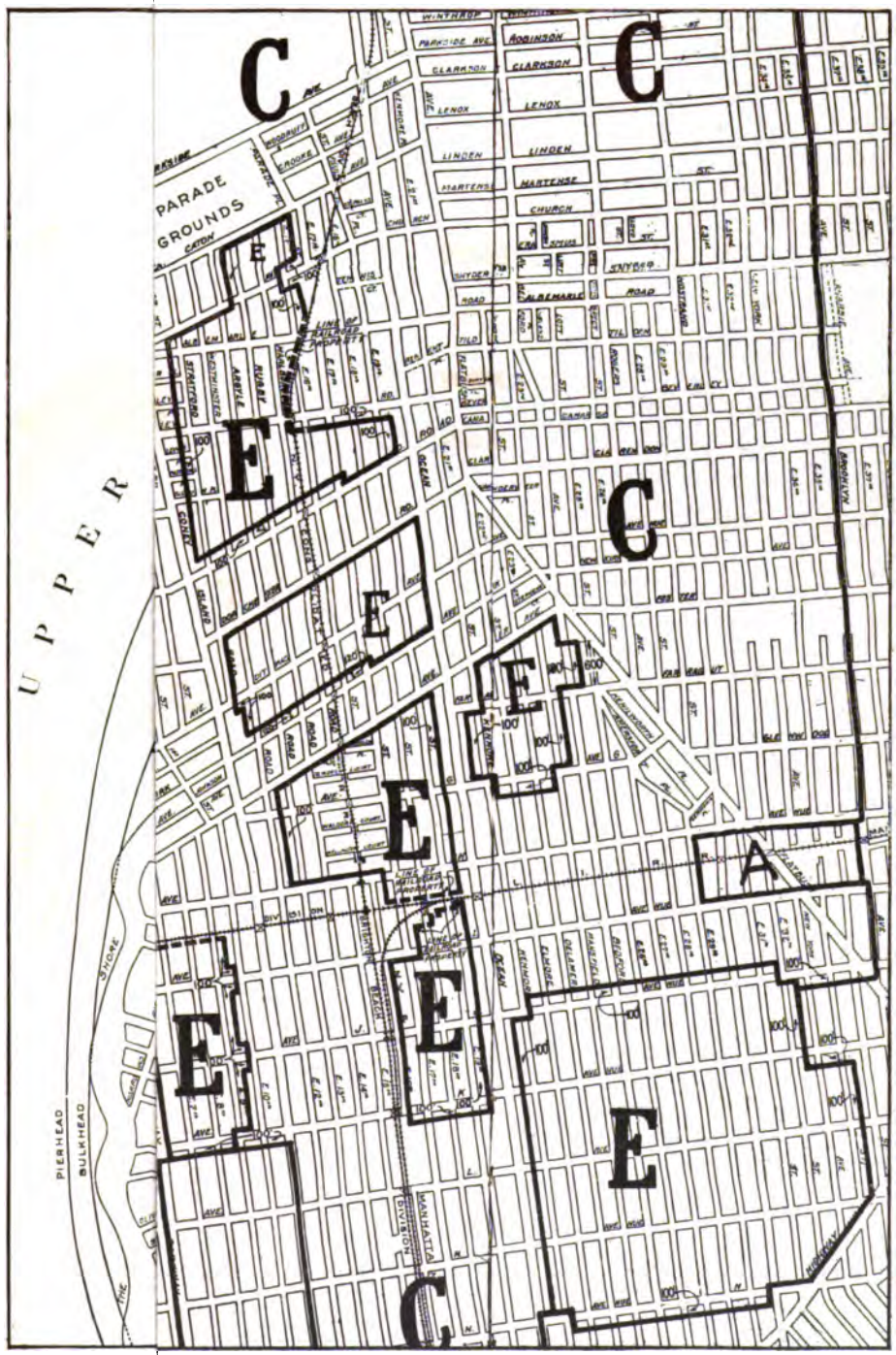
1000 0 1000 2000 FEET

The area districts as laid out on the area district map opposite, conform quite closely to the character of the present building development. Thus, the A districts on the South Brooklyn waterfront and along the Manhattan Beach Division of the L. I. R. R., include areas now occupied to a certain extent by industrial buildings, covering 90 per cent. to 100 per cent. of the area.

The D district south of Sunset Park, that south of Bay Ridge Avenue and east of Seventh Avenue, that west of Old New Utrecht Road and north of the Manhattan Beach division of the L. I. R. R., and that east of Greenwood Cemetery and north of Church Avenue will be seen to include dwelling house areas more or less developed with buildings usually occupying not more than 50 per cent. of the area, and into which apartment houses have not entered to any considerable extent.

Similarly the E districts on the Narrows south of 75th Street, the one east of 10th Avenue and south of 81st Street, and the several E districts east of Ocean Parkway will be seen to include residence localities in which the existing buildings usually cover less than 30 per cent. of the area of the lot on which they are built and in which districts few or no apartment houses are to be found.





UPPER
PARADE GROUNDS
PIERHEAD
BULKHEAD
SHORE
WINTHROP
PARKSIDE AVE
ROBINSON
CLARKSON
LENOX
LINDEN
MARTENSE
CHURCH
SNYDER
ALBEMARLE
ROAD
OCEAN
MANHATTA
DIVISION
C
E
A

APPENDIX III—DISTRICTING

From the Report of the Heights of Buildings Commission December 23, 1913

As applied to building restriction there are two general types of districting. Certain localities may be set off as residential or business or industrial districts. Industry and business may, for example, be excluded from the residence districts. The restrictions may go further and attempt to secure a certain type of residence district. The district may be restricted to one family or two family houses. Another type of districting is where different general height and area limitations are applied to all buildings in a particular district. Any thoroughgoing plan for the control of building development must make use of both of these types of districting.

The general scope of constitutional regulation

It is clear that such restrictions as are enacted must justify themselves as a reasonable exercise of the police power of the state. Under eminent domain the individual is compensated for the taking of his property. Under the police power there is also a constructive taking of property in certain cases, but without compensation to the individuals injured. It is theoretically conceivable that a general plan of building restriction and regulation might be entered upon by resort to the power of eminent domain, but, practically, such a solution is out of the question. The expense and burden of condemnation proceedings and litigation in multitudinous cases would create a tax burden that would increase rather than compensate for the injury to property interests. Moreover, the kinds of regulation under consideration are not such as to justify individual compensation. While they restrict individual liberty to a certain extent they do it in such a way as to conserve individual and public interests and rights. They subject the use of urban land to such restrictions as are appropriate and reasonable in the nature and history of this class of property.

The police power may be used to promote the public health, safety, order and general welfare. Protection of public health, safety and order constitute the police power in the primary or narrower sense of the term.[1]

It is a power so vital as to be undoubted when reasonably and justly applied. The exercise of the police power for the promotion of public comfort and convenience and for the promotion of general social and economic interests under the head of "the general welfare," while upheld by competent authority, will nevertheless be subjected to more careful scrutiny and more strict construction.

The position of the United States Supreme Court in regard to the scope

[1]Freund, Police Power, sec. 10.

of the police power is well stated by Justice Harlan in C., B. & Q. Railway *v.* Drainage Commissioners, 200 U. S. 561, 592, decided March 5, 1906:

> "The learned counsel for the railroad company seem to think that the adjudications relating to the police power of the state to protect the public health, the public morals and the public safety are not applicable in principle to cases when the police power is exerted for the general well-being of the community apart from any question of the public health, the public morals or the public safety. . . . We cannot assent to the view expressed by counsel. We hold that the police power of a state embraces regulations designed to promote the public convenience or the general prosperity, as well as regulations designed to promote the public health, the public morals or the public safety. . . . And the validity of a police regulation . . . must depend upon the circumstances of each case and the character of the regulation, whether arbitrary or reasonable and whether really designed to accomplish a legitimate public purpose."

Again in Welch *v.* Swasey, 214 U. S. 91, decided May 17, 1909, the same court through Justice Peckham concurs, at page 106, in the conclusion of the Massachusetts court "that regulations in regard to the height of buildings, and in regard to their mode of construction in cities, made by legislative enactments for the safety, comfort and convenience of the people and for the benefit of property owners generally, are valid." Finally in Eubank *v.* City of Richmond, 33 Supt. Ct. 76, decided December 2, 1912, Justice McKenna reiterates that the police power extends "not only to regulations which promote the public health, morals and safety, but to those which promote the public convenience or the general prosperity."

The New York Court of Appeals has taken substantially the same view of the scope of the police power. In People *v.* King, 110 N. Y. 418, Judge Andrews says (at page 423): "By means of this power the legislature exercises a supervision over matters involving the common weal and enforces the observance, by each individual member of society, of the duties which he owes to others and the community at large. It may be exerted whenever necessary to secure the peace, good order, health, morals and general welfare of the community. . . . In short, the police power covers a wide range of particular unexpressed powers reserved to the state affecting freedom of action, personal conduct and the use and control of property."

It is thus seen that the police power is broad and comprehensive. Yet it is by no means unlimited. A controlling limitation is that every resort to it should commend itself to the sober judgment as necessary, appropriate and reasonable, the infringement of private right being not disproportionate to the real public gain.

Freund in his treatise on the Police Power well states that a study of the various cases in which the police power has been applied "will reveal the police power not as a fixed quantity but as the expression of social,

economic and political conditions. As long as these conditions vary, the police power must continue to be elastic, *i. e.*, capable of development." If an informed and deliberate public opinion becomes educated to the necessity for the exercise of greater control over the planning and over the building of the city, and that such control cannot be effectively exercised except through the police power, it is clear that the police power is sufficiently elastic to meet the situation. The courts, while naturally conservative, have shown a strong disposition to favor all reasonable regulations for the control of the height, size and arrangement of buildings. As the public necessity for such regulations becomes more clearly apparent, we may expect the position taken by the courts to become more and more clearly defined in support of such control.

Bearing in mind the purposes and objects which justify a resort to the police power our study of the problem of controlling building development will be based chiefly on the following considerations:

(1) Public safety—Protection of property from fire and protection of the occupants of buildings from injury due to fire or panic.

(2) Public health—Importance of light, air and the prevention of congestion to health and sanitation.

(3) General welfare—(a) The comfort and convenience of the occupants of dwellings, offices and factories, through more adequate provision for light and air and in the case of dwellings through the maintenance of the essentially residential character of the neighborhood.

(b) The safeguarding of existing and future building investment values and the encouragement of an appropriate and orderly building development by such regulations as will prevent the taking from an existing structure of its minimum allotment of light and air and as will tend to maintain the character of a district.

(c) The prevention of street congestion.

Constitutionality of Districting

While the desirability of districting is generally recognized by all students of this subject there is a fear on the part of some that it may be held void as an infringement of the constitutional guarantee of equality. The constitutional guarantee of equal protection of the laws constitutes one of the most important limitations upon the police power. It means that the government shall not impose particular burdens upon individuals or corporations to meet dangers for which they cannot in justice be held responsible, and that all legislative discriminations or classifications shall be justified by differences of status, act or occupation corresponding to the difference of legislative measures.[1] The idea of equality excludes in principle both particular burdens and special privileges, but admits of reasonable classification.[2]

[1] Freund, Police Power, page V.
[2] Ibid., sec. 611.

The question of what constitutes reasonable classification comes up chiefly in connection with districting. To what length is it permissible to go in the division of the city into districts with varying regulations as to the height, size and arrangement of buildings? Other forms of classification have received quite general acceptance. Thus tenement houses have often been put in a separate class and subjected to more stringent regulations. This has been justified on the ground of greater importance in relation to public health or safety. Likewise height regulations have been adopted varying according to the width of the street. This is in effect a districting plan. The district changes with each variation in street width. This sort of districting is usual and approved. It may be justified directly on the ground of health and safety. A general plan of districting such as seems needful cannot be justified solely on such grounds. We cannot justify more stringent regulations for dwellings in the suburbs than in lower Manhattan on the ground that light, air and comfort for the residents of the suburbs are of greater public importance than for the residents of Lower Manhattan. It seems, however, that such districting can be justified if it can be shown to be essential to the general welfare. If regulations admittedly appropriate and reasonable for suburban areas are admittedly inappropriate and unreasonable for congested areas, the public importance and necessity for districting is clearly shown.

Classification or districting for the purposes of regulation must either be based directly on the purposes for which the police power may be exercised or it must be justified by difference in injury to vested interests. In order to justify more stringent regulations for dwelling-houses in the suburbs than for dwelling houses in lower Manhattan it must appear either that such regulations for the suburbs are more important to the public health, safety or general welfare than for lower Manhattan, or that while equally important for one or more of these purposes in both districts the suburban regulations would if applied to lower Manhattan interfere so seriously with existing property values as to render them of doubtful expediency or constitutionality. The courts will insist that there be some fair relation between the public good to be secured by the regulations and the private injury suffered. Building regulations must be reasonable in order to be constitutional. There is no absolute standard for all conditions. There must be a reasonable relation between the public object to be gained and the loss of property and liberty suffered. It is clear that any deprivation of individual liberty is a real public loss that must be justified by some greater public gain. It is also clear that extended injury to property interests may cause widespread public loss and consequently should have for its justification as an exercise of the police power some greater public gain. In order to be reasonable there must be a proportionateness of means to ends. This point is dwelt upon at length by Freund in his treatise on the Police Power. He says (sec. 63):

> "Leading courts have stated very distinctly that reasonableness is one of the inherent limitations of the police power; so the Supreme

Court of Mass.[1]: 'Difference of degree is one of the distinctions by which the right of the legislature to exercise the police power must be determined. Some small limitations of previously existing rights incident to property may be imposed for the sake of preventing a manifest evil. Larger ones could not be without the exercise of the right of eminent domain.' And the Supreme Court of the U. S.[2]: 'A Statute or a regulation provided for therein, is frequently valid or the reverse, according as the fact may be, whether it is a reasonable or an unreasonable exercise of legislative power over the subject matter involved, and in many cases questions of degree are the controlling ones by which to determine the validity, or the reverse, of legislative action,' and in Plessy *vs.* Ferguson,[3] in answer to the contention that the principle of separation might be carried to the length of assigning to black and white different quarters of the city for living or different sides of the street for walking, the Supreme Court said: 'The reply to all this is, that every exercise of the police power must be reasonable.' * * * There are few forms of control that cannot become unreasonable by an excess of degree: and there are many cases where no other principle of limitation is discoverable than that of reasonableness."

The districting of a city for building restriction purposes is made necessary by the fundamental characteristic of "reasonableness" which is the essential feature of a valid exercise of the police power. Especially in a city like New York it becomes necessary that building regulations should vary according to the character of the district and according to the type and use of the building. In certain districts suburban conditions of light and air can be maintained with great public advantage and with slight private loss; in other districts such favorable conditions of light and air, while theoretically just as desirable, are entirely impracticable, and any law that attempted to enforce them would be clearly unreasonable and void.

A classification based on proportionateness of means to ends is recognized in practically all building regulations. General maximum height regulations, for example, apply only to buildings hereafter constructed. In doing so they discriminate in favor of the owners of buildings already constructed. A lopping off of existing buildings in excess of the prescribed height is of no less importance to the health, safety and convenience of the public than the restriction of the height of an equal number of buildings hereafter to be erected. A discrimination in favor of buildings already constructed cannot be justified directly on the grounds for which the police power may be exercised. Such discrimination or classification finds abundant justification, however, when we apply the controlling principle of reasonableness and proportionateness of means to ends. The reconstruction of existing buildings

[1]Rideout *vs.* Knox, 148 Mass., 368.
[2]Wisconsin M. and P. R. R. Co. *vs.* Jacobson, 179 U. S., 287 (1906).
[3]163 U. S., 537.

would impose burdens on private owners disproportionate to the public gain. Such regulations would therefore be unreasonable and void. It seems that classification or exemption essential to the reasonableness of a regulation is itself reasonable. This principle constitutes an adequate justification for districting.

While a specific regulation taken by itself may not seem to have a very direct relation to the purposes for which the police power may be invoked, yet when taken as a part of a comprehensive plan for the control of building development throughout the entire city, its relation to such purposes may be unmistakable. Grant that a comprehensive system of districting is essential to the health and general welfare of the city and it follows that every specific regulation that is an essential part of such comprehensive system is justified under the police power.

Necessity for Districting

In this country comparatively little use has been made of districting. It has been carried out most fully in certain European cities. It is coming to be recognized as essential to well ordered, purposeful, economic and socially beneficial city growth. Haphazard methods of city construction result in a minimum of convenience with a maximum of cost to the public, and in general, to the individual as well.

The welfare of the people of a city is very largely dependent on the skill and foresight with which the city has been built. Upon this depends their opportunity for agreeable and remunerative occupation, for the enjoyment of leisure and the creation of a home. If factories and offices are dark and poorly ventilated, the worker suffers in health and comfort. If dwellings are huddled together without adequate provision for open spaces and if dwellings, stores and factories are thrown together indiscriminately, the health and comfort of home life are destroyed.

It will pay a city to attempt by every available means to conserve the health and general well-being of its inhabitants. This means increased productivity and increased productivity means higher wages for the laborer, higher profits for the employer and higher rents for the real estate owner.

The need for the creation of special restrictions for special districts is most clearly exemplified in the case of suburban residence districts. Here real estate developers have often found it profitable to secure control of large areas in order by restrictive covenants to insure to intending purchasers of homes the creation and maintenance of a residence section of a certain desired type. The surroundings and neighborhood are all important in securing desirable home conditions. Unless the general character of the section is fixed for a considerable period of years no one can afford to build a home. If he does build, a change in the supposed character of the neighborhood through the building of apartments, stores or factories may render the location undesirable for a home of the character he has built and thus greatly depreciate his investment.

Another general social factor that demands the zoning or districting of the city for building purposes under the police power is the recognized evil of congestion of population as exemplified on the lower East Side. All students of the subject recognize that such congestion of population is a real detriment to the health and civic fitness of the population of the district and a real menace to the welfare of the entire city. The problem is to prevent the repetition of these conditions in other parts of the city. Restrictions that would be upheld as reasonable for the present congested area would be clearly inadequate to prevent the repetition in other districts of conditions almost as bad as those now existing on the lower East Side. The only method by which this can be accomplished is by permitting the creation under the police power of different restrictions for different sections. Surely the prevention of undue congestion of population is a matter of such vital importance to the general welfare that it will justify any reasonable classification of buildings according to type and district; especially if the injury to vested interests resulting from such classification is comparatively small.

Manhattan with its skyscrapers is comparatively undeveloped. It is a fact that a large proportion of the area of lower Manhattan is now so poorly developed that the existing improvements are reckoned of no value for purposes of purchase or sale. The bare value of the land is all that is considered. This means that a large portion of the land of Manhattan is very inadequately utilized. Where space is so scarce this inadequate utilization is a great social and economic loss. This partial development and poor utilization of the land is even more apparent in all the other boroughs. A considerable percentage of the land even in what are considered built up districts, is either vacant or very inadequately utilized. In the suburbs the sprawling character of building development is everywhere apparent. The natural result of a poor utilization of its land area by a city is high rents for occupiers and low profits for investors. It may seem paradoxical to hold that a policy of building restriction tends to a fuller utilization of land than a policy of no restriction, but such is undoubtedly the case. The reason lies in the greater safety and security to investment secured by definite restrictions. The restrictions tend to fix the character of the neighborhood. The owner therefore feels that if he is to secure the maximum returns from his land, he must promptly improve it in conformity with the established restrictions. For example, he will not be deterred from immediate improvement by the consideration that while a detached house is at present an appropriate improvement it is probable that in 10 years an apartment house would be appropriate and that by waiting he will not only be able to reap the advantage of greatly increased land values, but will save great depreciation in the value of the detached house due to the fact that it has become an inappropriate improvement for the lot.

The same principle applies in the case of most types of buildings. As a general rule, a building is appropriately located when it is in a section

surrounded by buildings of similar type and use, all of which have been constructed with reference to that particular use. Anything that will tend to preserve the character of a particular section for a reasonable period of years, will tend to bring about the uniform improvement of the section. A large proportion of the land of New York City that is now unimproved or poorly improved is in that condition because the owners feel that the character of the section is changing, is bound to change in the near future or that the permanent character of the section is unknown. If restrictions were imposed so that the general character of particular sections could be forecasted with reasonable certainty for a period of years, owners who had been holding back on account of the uncertainties of the situation would find it clearly to their advantage to improve their holdings. The result would be that these restricted sections would be more quickly built up with buildings of similar type and use. This should have the effect of improving living conditions, reducing the cost of living and maintaining real estate values.

Any growing city that fails to control building development must inevitably suffer enormous loss due to building obsolescence. Obsolescence may be defined as lack of adaptation to function. It results from changed conditions and surroundings that render the building an inappropriate improvement for the particular location. The total social loss does not consist merely of the great cost of building reconstruction or of the great decline in the rental value of the inappropriate buildings that are not reconstructed, but there is added to this the social loss due to the retardation of real estate improvements owing directly to the obsolescence hazard.

In a memorandum submitted to the Commission by Frederick L. Ackerman, the importance of districting and its superiority over private restrictive covenants, is clearly pointed out. Mr. Ackerman says:

> "We should not confuse the term 'zoning' with the ideas surrounding the present use of the word 'restriction.' It is true that restrictions upon property are a necessary part of any scheme of zoning, but there is a fundamental difference in the nature of the restrictions. When a group of individuals restrict a section of the city, it is done for the purpose of conserving that section for a particular use. In practice, this object is rarely attained for the simple reason that there are parcels of property within that section which, for one reason or another, are withheld with the result that sooner or later these pieces are used for a purpose detrimental to the adjacent property, causing the restricted property to depreciate in value. Oft times the restrictions made by individual owners hamper seriously the growth of a section, and in practice, instead of conserving the section to a better development of the particular activity for which it was intended, these restrictions simply serve as a check upon its development owing to the fact that owners know that sooner or later the restrictions will be removed, when other activities will enter and

disintegrate the values. When the city places restrictions over a section, these apply to all properties, with the result that there immediately begins a more permanent development along the lines for which the section is to be used, and properties increase in value.

"We have given too much weight to the ideas surrounding geographical location and have not considered seriously the idea that the value of property depends upon the degree to which a certain section is developed for a certain use. Values appreciate in sections where it is known that the development is to be maintained along definite and well established lines. For instance, the values in office building sections are dependent upon the degree of the development of that section for that particular use. This idea holds in loft, factory and residential sections, shopping districts, and the like, and experience has taught us that as soon as new elements are introduced into these sections of a nature tending to lower the standard of the section, the values of the properties are correspondingly reduced. There is no economy in the present method of continually shifting geographically the various interests of the city. We should rather foster the idea of developing various sections for a particular use and place a premium upon the erection of permanent, well designed structures within that section, to be used for that particular purpose for which the section is restricted."

Height Districts in American Cities

The chief American examples of districting as applied to the height of buildings are furnished by Boston, Baltimore, Indianapolis and Washington.

Boston

In Boston the entire city has been divided into two districts—District A and District B. In District A, the business section of the city, buildings may not exceed 125 feet in height. In District B, the residential area of the city, buildings may not exceed 80 feet in height except on thoroughfares over 64 feet in width. On such streets, buildings may be erected to a height equal to 1¼ times the width of the street, but no buildings in District B may be erected to a greater height than 80 feet unless its width on each and every abutting public street is at least one-half of its height. No building, however, in either District A or District B may be of greater height than 2½ times the width of the widest abutting street. This districting has been done under authority of a special act of the legislature through the agency of a commission appointed for the purpose. The regulations, which are considered in detail in Appendix IV, have been upheld by the highest court, both of the State and of the United States.

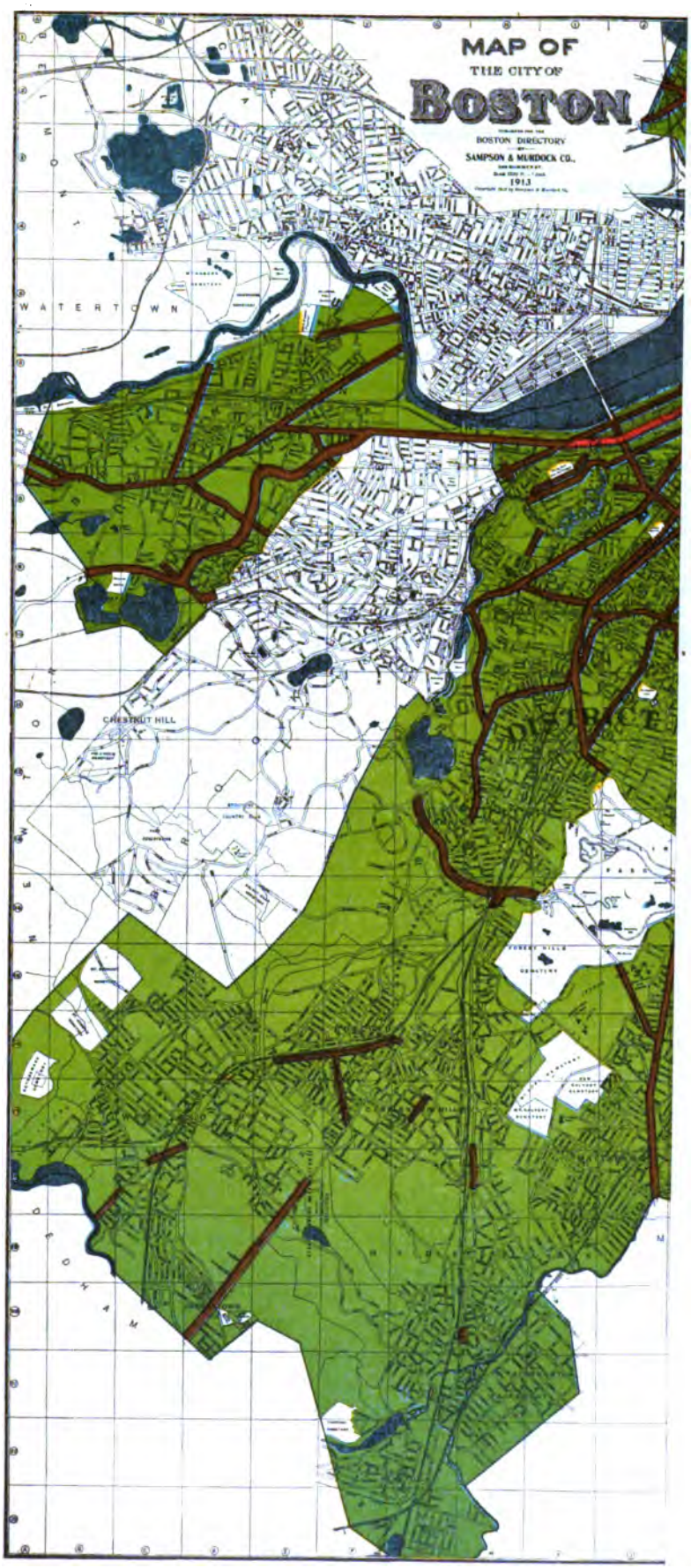
In regard to the constitutionality of districting, the Massachusetts court[1] points out that any police regulation must be reasonable "not only

[1]Welch *vs.* Swasey, 193 Mass., 364; 79 N. E., 745, January 1, 1907.

in reference to the interest of the public, but also in reference to the rights of landowners." If these rights and interests are in conflict "the opposing considerations should be balanced against each other and each should be made to yield reasonably to those upon the other side." The court indicates that this consideration makes it necessary in considering the height limitation to have reference "to the use for which the real estate probably will be needed." The court calls attention to the fact that the value of land and demand for space in the business district is such as to call for buildings of greater height than in the residential district.

The case was carried to the Supreme Court of the United States and the constitutionality of the act again affirmed. (Welch *vs.* Swasey, 214 U. S. 91, 29 Sup. Ct., 567, decided May 17, 1909.) It was contended by the appellant that the real purpose of the act was to preserve architectural symmetry and regular sky line, and that the police power could not be exercised for such a purpose. It was further contended that the infringement upon property rights was unreasonable and disproportional to any public necessity and that the distinction between 125 feet for the height of buildings in District A and 80 feet to 100 feet for buildings in District B was wholly unjustifiable and arbitrary, having no reference to public safety or to any purpose appropriate to the police power. The Supreme Court rejected these contentions, stating that the reasons contained in the opinion of the State court were, in the opinion of the Supreme Court, sufficient to justify the validity of the regulations in question. Justice Peckham, in delivering the opinion of the court, refers to the justification of the districting provision based on the greater value of land in District A, presented by the State court. He also finds an additional reason for the districting provision in a greater danger in case of fire from tall buildings in a residential district. He says (at pages 106-108):

> "In this case the Supreme Judicial Court of the State holds the legislation valid, and that there is a fair reason for the discrimination between the height of buildings in the residential as compared with the commercial districts. That court had also held that regulations in regard to the height of buildings, and in regard to their mode of construction in cities, made by legislative enactments for the safety, comfort or convenience of the people and for the benefit of property owners generally are valid. Attorney General *vs.* Williams, 174 Mass., 476. We concur in that view, assuming, of course, that the height and conditions provided for can be plainly seen to be not unreasonable or inappropriate.
>
> "In relation to the discrimination or classification made between the commercial and residential portion of the city, the State court holds in this case that there is reasonable ground therefor in the very great value of the land and the demand for space in those parts of Boston where a greater number of buildings are used for the purpose of business or commercially than where the buildings are situ-


MAP OF
THE CITY OF
BOSTON
BOSTON DIRECTORY
SAMPSON & MURDOCK CO.,
1913
WATERTOWN
CHESTNUT HILL
DISTRICT

ated in the residential portion of the city, and where no such reasons exist for high buildings. . . .

"We are not prepared to hold that this limitation of eighty to one hundred feet, while in fact a discrimination or classification, is so unreasonable that it deprives the owner of property of its profitable use without justification, and that he is therefore entitled under the Constitution to compensation for such invasion of his rights. The discrimination thus made is, we think, reasonable, and is justified by the police power . . . . The reasons contained in the opinion of the State court are in our view sufficient to justify this enactment.'

Baltimore

A special act of the Maryland Legislature, passed in 1904, limited the height of buildings within one block of the Washington Monument in the City of Baltimore to 70 feet. At that time the general maximum height limit for the entire city was 175 feet. The districting act was held to be constitutional by the Court of Appeals of Maryland in a decision of June 24, 1908 (Cochran *vs.* Preston, 70 Atl., 113). The appellant in this case claimed that the regulation was an infringement of the constitutional guarantee of equal protection of the laws and due process of law. The statute applied a special rule to a certain small district, and as to that district, provided an exemption in the case of churches. Moreover, the limitation was not uniform for the district, inasmuch as the district was hilly and the statute provided for a uniform limit of height, not exceeding 70 feet "above the surface of the street at the base line of the Washington Monument." Under this restriction a higher building could be erected on lower ground than upon higher ground within the district. The appellant claimed also that the restriction was for the purpose of preserving the beauty and architectural symmetry of the environment of Washington Monument, and that, in the exercise of the police power, property rights cannot be impaired for purely aesthetic purposes. In sustaining the constitutionality of the statute, the court held that its purpose was not purely aesthetic, but for the purpose of protecting from fire handsome buildings and works of art in the locality.

The court overruled the objection raised on account of lack of uniformity of application. Owing to the hilly condition of the prescribed territory, persons owning property on lower ground would be able to construct higher buildings than those whose property was located on higher ground. This discrimination was also justified on the ground of protection against fire. The exemption of churches from the restriction was also upheld, on the ground that churches "do not present the same danger from fire to the surrounding buildings as many other structures do, chiefly because they are not liable to become very numerous in any one locality." On the general subject of regulation, the court states that the use of land must be subject to reasonable regulation, in the interest of the general welfare.

Indianapolis

In 1912 the City Council of Indianapolis passed an ordinance limiting the maximum height of all buildings erected in the city at 200 feet. An ordinance of 1905 limits the height of buildings erected on Monument Place at 86 feet. Monument Place is the circular street encompassing the Soldiers' and Sailors' Monument. It has a diameter of about 600 feet and an outside circumference of about 1,880 feet. The constitutionality of the ordinance has never been tested in the courts.

Washington

Washington is districted for height limitation purposes under an act of Congress applicable to the District of Columbia. The regulations are more stringent than those of any other city in this country, with the possible exception of Boston. The limitations in the business section are a trifle more lenient than those in Boston, but in the residence section they are more rigid. All streets are designated as either business streets or residential streets. No building may be erected on a business street to a greater height than the width of the widest abutting street increased by 20 feet, subject, however, to an absolute limit of 130 feet. An exception to this regulation is made in two instances. Buildings on the north side of Pennsylvania Avenue, between First and Fifteenth Streets, are allowed an extreme height of 160 feet. Buildings fronting or abutting on the plaza in front of the new Union Station may not exceed a height of 80 feet. On the residential streets the maximum height limit is 85 feet, subject to certain provisions. The height may not exceed the width of the street diminished by 10 feet on streets more than 70 feet in width. The height may not exceed 60 feet on streets between 60 and 70 feet in width. The height may not exceed the width of the street on streets less than 60 feet in width. The constitutionality of these regulations does not appear to have been tested.

Regulation of Open Spaces in Richmond, Virginia

By an act of the General Assembly of Virginia, passed March 14, 1908, councils of cities and towns are authorized, among other things, "to make regulations concerning the building of houses in the city or town, and in their discretion . . . in particular districts or along particular streets, to prescribe and establish building lines, or to require property owners in certain localities or districts to leave a certain percentage of lots free from buildings, and to regulate the height of buildings" (Acts, 1908, pp. 623, 624). By virtue of this act, the City Council of Richmond passed an ordinance "that whenever the owners of two-thirds of the property abutting on any street shall, in writing, request the committee on streets to establish a building line on the side of the square on which their property fronts, the said committee shall establish such line, so that the same shall not be less than five feet nor more than thirty feet from the street line."

NEW RESERVOIR

The validity of a building line regulation under the above ordinance came before the Supreme Court of Appeals of Virginia in Eubank v. City of Richmond, 110 Va. 749, 67 S. E. 376, decided March 10, 1910. In delivering the opinion of the court Judge Whittle refers to the case of Welch v. Swasey and concludes as follows: "In the present case the statute is neither unreasonable nor unusual, and we are justified in concluding that it was passed by the Legislature in good faith and in the interest of the health, safety, comfort or convenience of the public, and for the benefit of the property owners generally who are affected by its provisions, and that the enactment tends to accomplish all, or at least some, of these objects. The validity of such legislation is generally recognized and upheld."

The case was appealed to the Supreme Court of the United States (Eubank v. City of Richmond, 33 Sup. Ct. 76, decided December 2, 1913). Justice McKenna in delivering the opinion of the court first comments generally on the police power as follows:

> "Whether it is a valid exercise of the police power is a question in the case, and that power we have defined, as far as it is capable of being defined by general words, a number of times. It is not susceptible of circumstantial precision. It extends, we have said, not only to regulations which promote the public health, morals and safety, but to those which promote the public convenience or the general prosperity. But necessarily it has its limits and must stop when it encounters the prohibitions of the Constitution. A clash will not, however, be lightly inferred. Governmental power must be flexible and adaptive. Exigencies arise, or even conditions less peremptory, which may call for or suggest legislation, and it may be a struggle in judgment to decide whether it must yield to the higher considerations expressed and determined by the provisions of the Constitution."

The court found the regulation unconstitutional, its finding being based on the fact that under the ordinance a building line must be established whenever two-thirds of the property owners abutting on any street shall petition the committee on streets to establish such a line. The court holds that an important power of this kind cannot be vested in any number of property owners with power to use as they see fit and presumably in their own interest and not in the interest of public comfort or convenience. Though the particular ordinance in question was held to be unconstitutional, the opinion of the state court and the general treatment of the case by the Supreme Court of the United States give considerable ground for the hope that building line regulations properly based will be held constitutional. This is clearly the view of the matter taken by the city of Richmond, for, following the above decision by the Supreme Court of the United States, it passed another ordinance (April 22, 1913) prescribing the procedure by

which building lines may be established in the discretion of the council in particular districts or along particular streets.

Residential and Industrial Districts in American Cities

The legislation of the past few years shows a distinct trend toward the creation of specially restricted residential districts. Legislation has been enacted by New York, Massachusetts, Minnesota, Wisconsin, Maryland and Virginia. Ordinances have been passed in Richmond, Milwaukee, Minneapolis, Seattle and Los Angeles.

New York cities of the second class

The new housing law for cities of the second class, passed by the New York legislature in 1913 (ch. 774), authorized the common council on petition of two-thirds of the owners affected to establish residence districts within which no building other than a single family or a two family dwelling may be constructed. A residence district once created shall continue as such until a like petition shall be presented to and approved by the common council. The unit of area for the residence district consists of the lots fronting on one side of a street between two intersecting streets.

Massachusetts

In 1912 the legislature of Massachusetts passed an amendment to the general municipal act (chapter 334, laws 1912) that permits every city and town in the state, except Boston, to regulate the height, area, location, and use of buildings and other structures within the whole or any defined part of its limits for the prevention of fire and the preservation of life, health and morals. The power extends to all buildings and other structures except bridges, quays and wharves and structures owned or occupied by the national or state government.

Minnesota

The legislature of Minnesota at its last session (laws 1913, ch. 420) passed an act empowering the cities of Duluth, Minneapolis and St. Paul to establish residential and industrial districts. The city council, when petitioned by 50 per cent. of the property owners in a district, may by a lishment, no matter what its character, may be excluded from a residential district. The erection and maintenance of any industrial or business establishment, no matter what its character, may be excluded from a residential district. Even tenements, apartment houses and hotels may be excluded from such a district. In the designation of industrial districts, the city council is authorized to classify the various industries and in its discretion to restrict each class to a definite and limited area. Upon a petition of 50 per cent. of the property owners in a district, the council may set aside its original restrictions, and establish an industrial district out of a residential district, or vice versa.

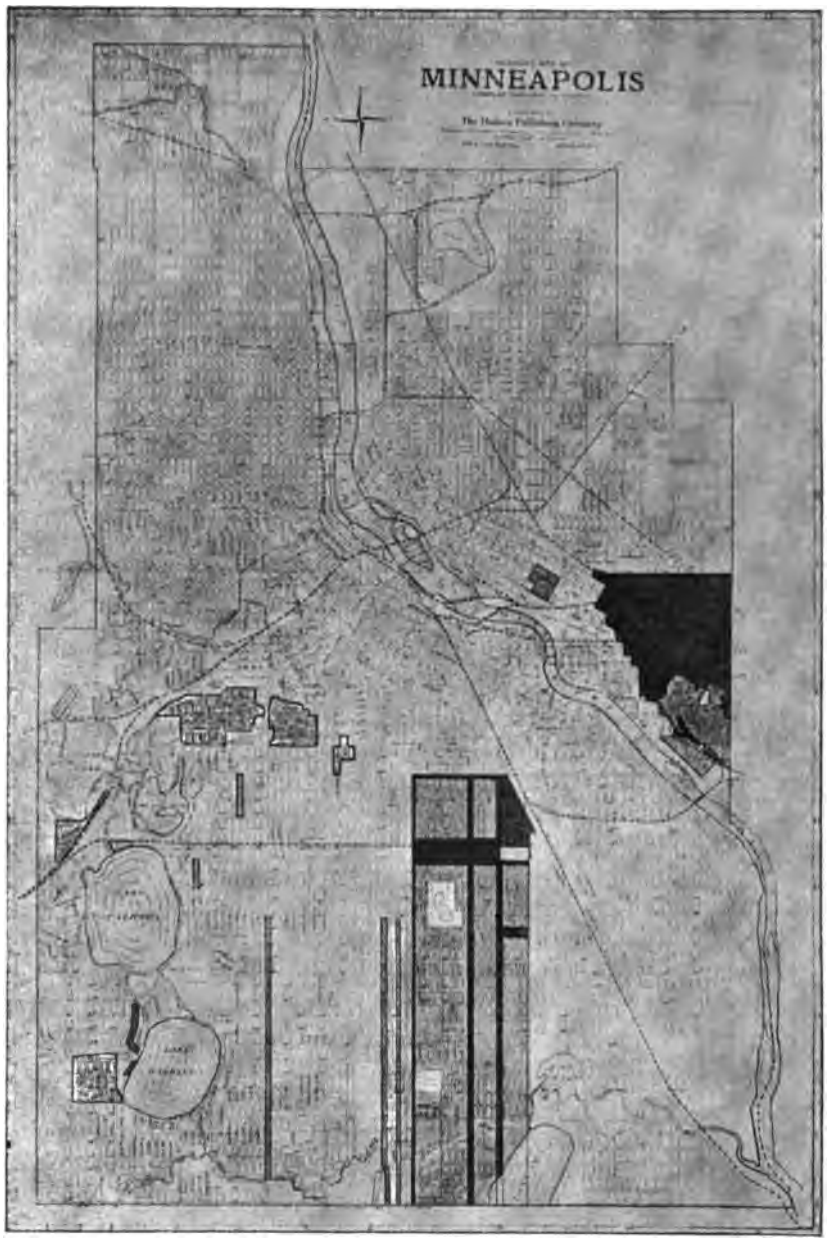


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FIG. 49—DISTRICTING IN MINNEAPOLIS.

Darker shading indicates industrial districts. Lighter shading indicates residential districts.

Minneapolis has already taken advantage of this act on several different occasions. The city council has passed ordinances classifying and designating certain buildings, business occupations, industries and enterprises as business industries and defining and designating certain districts in the city as industrial and residential districts, within which such buildings, occupations or enterprises may or may not be maintained or carried on. The question of the constitutionality of these ordinances has not as yet come before the courts.

Wisconsin

The legislature of Wisconsin at its last session passed an act (laws 1913, chapter 743) authorizing cities of 25,000 inhabitants or more to set aside exclusive residential districts. There are at present eight cities in the state of this size—Milwaukee, Green Bay, La Crosse, Madison, Oshkosh, Racine, Sheboygan and Superior.

The common council may set apart portions of the city to be used exclusively for residential purposes and may prohibit the erection and maintenance of factories, docks or other similar concerns within such districts. The council may also restrain the encroachment of business houses upon purely residence districts, and require the consent of the majority of landowners and residents of such districts, before such business is permitted. The power granted may be exercised upon the initiative of the common council, or upon the petition of ten or more residents in the district or block to be affected. The enactment of ordinances excluding factories, docks or other similar concerns from residential districts shall be a final and conclusive finding that factories operated in such districts are detrimental to the health, comfort and welfare of the residents of the city. Milwaukee is at present mapping out residential districts in accordance with this act.

On January 13, 1913, several months prior to the passage of the above act, the common council of Milwaukee passed an ordinance making it unlawful to maintain slaughter houses, rendering plants or rag shops anywhere inside the city limits.

This ordinance also established what is known as "the business section." Businesses within the business section are subject to no restrictions, but outside the business section the ordinance forbids the maintenance of certain businesses unless such business shall first obtain the written consent of two-thirds of all the real estate owners within 300 feet of the space proposed to be occupied. The businesses coming within the prohibition are: Livery, boarding or sales stables, gas reservoirs or holders, paint, oil or varnish works, salesrooms or storage rooms for automobiles and garages for the keeping of automobiles for hire. When outside the business section these businesses must be maintained in buildings that conform to the requirements prescribed within the fire district. An ordinance passed on January 11, 1913, imposes similar conditions on garages maintained in certain blocks

in the business section that are of a residential character. No garage may be maintained in a block where two-thirds of the buildings in a block are devoted to exclusively residential purposes without the written consent of the property owners on both sides of the street or alley in such block.

Baltimore

In 1912 the state legislature of Maryland passed an act (ch. 693) regulating the erection of dwelling houses in that part of the city of Baltimore known as Forest Park. The dwelling houses constructed in this district, the area of which is about a half mile square, must be separate and unattached buildings. Frame dwellings must be at least 20 feet apart; stone and brick dwellings at least 10 feet apart. The constitutionality of the act has not come before the courts.

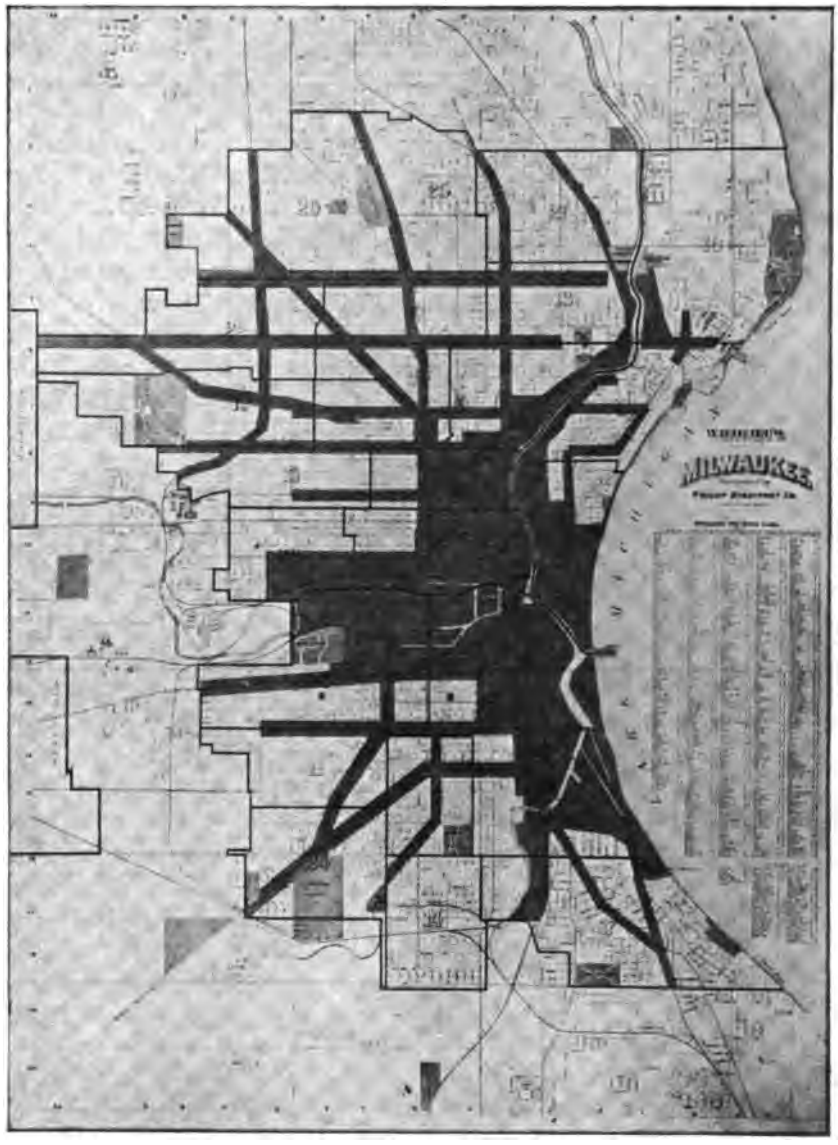
The most important classification of buildings according to character and use in the city of Baltimore, as a whole, is that found in section 47 of the building code. This section (subdivisions 12 and 13) limits the location of certain buildings. These buildings are: (1) hospitals and buildings for treatment of the feeble-minded; (2) sanatoriums; (3) livery stables; (4) sale and boarding stables; (5) garages; (6) blacksmith shops; (7) junk shops; (8) brick, tile and terra cotta factories; (9) stoneware and earthenware factories; (10) paint factories; (11) soap factories; (12) candle factories; (13) wood-working factories; (14) the storing and altering of packing boxes on any lot or in any building; (15) lumber yards; (16) planing mills; (17) iron mills; (18) foundries; (19) breweries; (20) distilleries; (21) packing houses; (22) gas works; (23) acid works; (24) the manufacture of fertilizers.

No permit for the erection of any of the above buildings is given by the inspector of buildings except by the approval of the mayor. In granting his approval, the mayor incorporates such regulations in the permit regarding the location of the building as may, in his judgment, be necessary to safeguard the interests of the public. Permits for such buildings are issued only after 10 days' public notice of the application therefor.

If protests are filed against the granting of the permit, the building inspector holds a hearing. After hearing the protests and considering the rights of the surrounding property owners, the building inspector makes a presentation of the facts to the mayor. Where there is a protest, the permit requires the joint approval of the inspector and the mayor. In granting or withholding their approval to a permit, the building inspector and the mayor are prompted by three considerations: (1) the fire hazard of the proposed building: (2) the effect of the proposed building on surrounding land values, and (3) the effect of the proposed building on the general welfare of the residents in the immediate vicinity.

Seattle

Under the Seattle building code adopted in July, 1913, no building not now used for such purposes may be reconstructed, altered or repaired to



By courtesy of Wright Directory Co.

Fig. 50—DISTRICTING IN MILWAUKEE.

Industries are unrestricted in shaded area.

be used for any of the following purposes without the consent of the city council and the mayor: (1) confinement of insane children or adults; (2) manufacture of cotton wadding, laps or bats; (3) refining of petroleum or any of its products; (4) distillation of spirits of turpentine or varnish; (5) manufacture of explosives; (6) rendering of fats, lards and like products; (7) hair factory; (8) lime kiln; (9) tannery; (10) refinery; (11) abattoir; (12) glue factory; (13) manufacture of roofing materials of chemcal composition; (14) pulverizing charcoal; (15) stockyards; (16) poudrette works; (17) asphalt plant; (18) manufacture of fertilizers; (19) smelter.

Before any ordinance shall be passed authorizing the construction, alteration and repair of any "prohibited" building at least 10 days' notice shall be given by the party applying for the passage of such ordinance by a publication to that effect of at least four insertions in two or more daily newspapers. This notice must specify the lot upon which such building is to be erected, altered or repaired, and the purposes for which it is intended to be used in sufficient detail to apprise the property owners in the vicinity of the exact location and nature of the proposed improvement. Notice of such application must, however, be conspicuously posted on the property.

In addition to the above, the following buildings are limited as to location: (1) hospitals and buildings for treatment of the feeble minded; (2) sanatoriums; (3) dairies; (4) dog pounds; (5) blacksmith shops (6) junk shops; (7) rag shops; (8) brick, tile and terra cotta factories; (9) stoneware and earthenware factories; (10) paint factories; (11) silk factories; (12) candle factories; (13) woodworking factories; (14) lumber yards; (15) planing mills; (16) iron mills; (17) foundries; (18) breweries; (19) distilleries; (20) packing houses; (21) gas works; (22) acid works.

No permit is issued for a "limited" building until at least 10 days' notice of the application has been published four times in two or more daily papers and until notice of such application has been conspicuously posted upon the property for a like period of time. If any owner of property within 500 feet of the proposed location files a protest with the superintendent of buildings, the matter is referred to the board of public works for determination, after hearing. Special regulations govern the location of stables and public garages.

Los Angeles

The first districting ordinance in Los Angeles was passed in 1909. The entire city, with the exception of two suburbs, is divided into industrial and residential districts. There are twenty-five industrial districts and one residential district. The residential district comprises the whole districted territory exclusive of the areas within the several industrial districts. It therefore encircles and surrounds many of the industrial districts.

The so-called industrial districts do not fairly indicate the extent of the industrial area of the city. In addition to the industrial districts there are

fifty-eight districts, known as "residence exceptions," in the residential district that are exempt from the regulations applicable to the residential district and in which business is permitted subject to certain conditions.

The industrial districts vary considerably in shape and size. The largest district has an area of several square miles. At its greatest dimensions, it measures five miles in length and two miles in width. The smallest district comprises one solitary lot. The combined area of the several industrial districts aggregates not more than one-tenth that of the residential district. The industrial districts are, on the whole, pretty well grouped in one part of the city.

The "residence exceptions" are all small. The largest is about a half mile square. With this exception no "residence exception" covers a greater area than two city blocks. In most instances these districts do not occupy more than one or two lots. The combined area of the fifty-eight "residence exceptions" is probably not more than one per cent. of the residential district. The "residence exceptions" are, however, scattered more widely throughout the residential district than are the industrial districts.

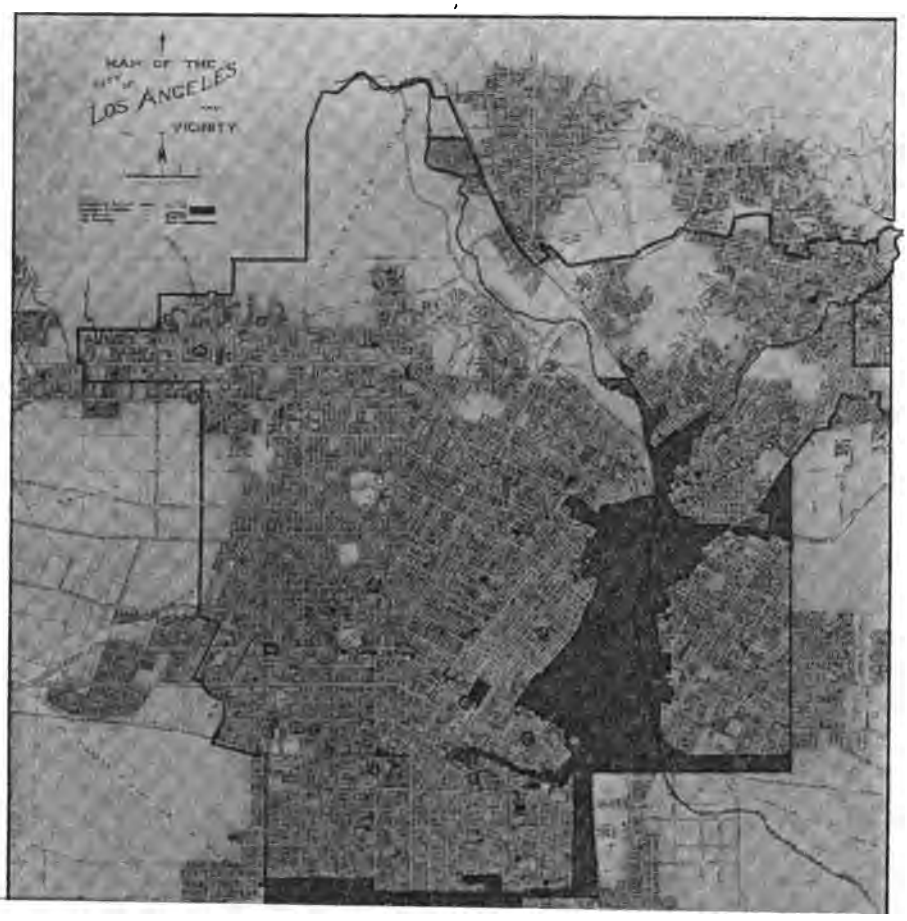
In general the distinction between the industrial districts and the residential district is this: All kinds of business and manufacturing establishments are unrestrained in most of the industrial districts, while certain specified businesses are excluded from the residential district. Those businesses not especially excluded are permitted in the residential district. All but the very lightest manufacturing is prohibited in the residential district. The less offensive business and manufacturing establishments excluded from the residential district may be carried on in the "residence exceptions." The owners of sixty per cent of the neighboring property frontage must give their consent to the creation of any "residence exception."

The constitutionality of the industrial and residential districts in Los Angeles was sustained by the Supreme Court of California in October, 1911, in the case of *Ex Parte* Quong Wo, 161 Cal. 220, 118 Pac. 714.

When the city had been districted about 110 Chinese and Japanese laundries found themselves in the residential district. The city immediately undertook to remove them to the industrial districts. The present mayor, Mr. H. H. Rose, then a police judge, upheld the ordinance and sentenced a Chinaman, Quong Wo, to pay a fine of $100 or to serve 100 days in jail. Wo appealed to the Supreme Court of the State, and the ordinance was sustained.

The petitioner, a native and citizen of China, was charged with having maintained and carried on a public laundry and wash house within the residential district. He had conducted such laundry and wash house at said location, occupying the premises under a lease which had two years yet to run.

The court stated that it could not take judicial notice that there had been unjust discrimination in excepting small parcels from the residential district of the city as established by ordinance, and adding them to the


MAP OF THE
CITY OF
LOS ANGELES
AND
VICINITY

industrial district; the presumption being in favor of the legality of the action of the legislative body. That small parcels, consisting of only one city lot, were excepted by the city council from the "residence district" of a city as fixed by ordinance, within which district certain occupations could not be followed, and added to the industrial district, when such parcels were surrounded on all sides by parts of the "residence district," did not of itself show unjust discrimination in excepting territory from the residence district.

The court held that lawful occupations, such as laundry business, might be confined to certain limits in the city wherever such restrictions might reasonably be found necessary to protect the public health, morals and comfort. An ordinance prohibiting the maintenance of public laundries and wash houses in those parts of the city designated as the "residential district" could not be said to be unreasonable and invalid, though large parts of such districts might be sparsely built up, in the absence of the facts showing unjust discrimination. Whether restrictions upon the operation of a business in certain portions of a city are reasonably necessary for the protection of the public health, safety and welfare, the court construed as being primarily for the determination of the city council. Such action by the city council, the court held, would not be disturbed by the court, unless the regulations had no relation to the public health, safety or welfare, or unless they clearly invaded personal or property rights under the guise of police regulations.

In *Ex Parte* Montgomery, 163 Cal. 457, 125 Pac. 1070, the Supreme Court rendered a decision that was almost identical with that in *Ex Parte* Quong Wo, this time ejecting a lumber yard from the residential district.

In *Ex Parte* Hadacheck, 132 Pac. 589, decided May 15, 1913, the Supreme Court again sustained the constitutionality of the Industrial and residential districts. In this case, the petitioner owned a brick yard in the residential district. He had acquired the land for this brick yard in 1902, before the territory to which the ordinance was directed had been annexed to Los Angeles. The land contained valuable deposits of clay suitable for the manufacture of brick, and was more valuable for brickmaking than for any other purpose. The petitioner had during the entire period of his ownership used the land for brickmaking and had erected on it the kilns, machinery and buildings necessary for such manufacture.

In upholding the constitutionality and ejecting the brick yard from the residential district, the court held that the police power is not restricted to the suppression of nuisances, but extends to the regulation of the conduct of business and to the use of property to the end that public health or morals may not be impaired or endangered.

The court also held that the right of the legislature, in exercising the police power to regulate or in proper cases to prohibit the conduct of a given business, is not limited by the fact that the value of investments made in the business prior to any legislative action will be greatly dimin-

ished. A business which, when established, is entirely unobjectionable, may by the growth of population in the vicinity become a source of danger to the health and comfort of those who have come to be occupants of the surrounding territory. If the legislature should then prohibit its further conduct, the proprietor can have no complaint upon the mere fact that he has been carrying on the trade in that locality for a long time. The power to regulate the use of property or the conduct of a business is, of course, not arbitrary. The restriction must bear a reasonable relation to some legitimate purpose within the purview of the police power.

Where a region surrounding a brick yard has become primarily a residential section, and the occupants of neighboring dwellings are seriously discommoded by the operations of the yard, the court held that a prohibition of the business in the district is not objectionable, as being an arbitrary invasion of private right, but is a valid exercise of police power to prevent injury to others.

Where there are reasons justifying the prohibition of a business within an area described in an ordinance adopted by a city, the court states that in determining the validity of the prohibition, it will not consider whether conditions in other parts of the city require a like prohibition, as that presents a legislative question.

Ontario, Canada

The councils of cities having a population of not less than 100,000 may under section 410 of the Ontario Municipal Act pass by-laws prohibiting, regulating and controlling the location or erection of apartment or tenement houses and of garages to be used for hire within any defined area or on land abutting on defined highways or parts of highways. An apartment or tenement house is a building that provides three or more separate suites or sets of rooms for separate occupation by one or more persons. Toronto has, in accordance with these provisions, restricted the character of the development of a large portion of its territory. Apartment houses and garages are excluded from most of the residential streets of the city.

The Municipal Act of Ontario (Sec. 409) empowers the council of every city in the Province to pass by-laws preventing, regulating and controlling the location, erection and use of the following buildings: livery, boarding or sales stables; stables in which horses are kept for hire or kept for use with vehicles in conveying passengers, or for express purposes; stables for horses for delivery purposes; laundries, butcher shops, stores, factories, blacksmith shops, forges, dog kennels and hospitals or infirmaries for horses, dogs or other animals. The erection or use of buildings for all or any of these purposes may be prohibited within any defined area or areas or on land abutting on any defined highway or part of a highway. By-laws of this character may not be passed except by a vote of two-thirds of all the members of the council. Such by-laws, moreover, may not apply to a building which was on April 26, 1904, erected or used for any of these purposes so long as it is used as it was used on that date.

Districting in German cities[1]

Districting is most fully developed in German cities. There it is known as the zone system. The term zone was particularly appropriate in Germany where special regulations were applied to the successive belts of building development surrounding the central walled city. At present, however, in many German cities the districts are not concentric zones, and the system might more appropriately be called the "district system."

The district system is a method of regulating buildings as a part of a general city plan. It has two characteristics: it groups buildings of different classes and it limits the density of buildings progressively, allowing buildings to be higher, and to cover more of the lot in the centers where land values are greater and business needs require more concentration, and making the requirements more and more severe as the distance from these centers increases.

Under the German rules the height of buildings is invariably regulated with relation to the width of the street upon which the building is situated; and also, usually, by a maximum which, irrespective of the width of the street, it must not exceed. In many cities, in the zone or zones of greatest concentration, a height a little in excess of the street width is allowed; in the other zones it must not exceed that width, and in the outer zone or zones the maximum limits it to less. Usually, too, there are minimum courts, and all rooms constructed for the residence or long continued business use of mankind must have a window upon a court of at least a specified size. The proportion of the lot that may be covered by buildings, also, is almost invariably limited progressively, buildings on corner lots in each zone being allowed to cover more than those on inside lots. The ordinances in the different cities differ in detail, but in general the system is the same. The provisions of the Frankfort ordinance illustrate it as well as any other:

The older inner city is the first zone or district. Here the highest buildings are allowed. They must not exceed the width of the street, plus about 10 feet (three meters). Or in any case, however wide the street, about 66 feet (20 meters). This is to the cornice; the roof above this is restricted by an angle, and in no case may exceed about 30 feet (nine meters). The roof is more than mere roof; it is a roof story, in which there are rooms, which, however, may not always be used for residence. The number of stories is also restricted; in this zone it must not exceed five, and the roof story.

Here in the inner city, also, the greatest proportion of the lot may be covered with buildings, three-quarters—for corner lots, five-sixths. Factories are allowed but are not numerous. Solid blocks are permitted. The city here presents the appearance of being fully built up to a fairly uniform height.

[1] A complete report on "The German Zone Building Regulations," prepared by Frank Backus Williams, is contained in the Report of the Heights of Buildings Commission, 1913, at page 94.

The outer city is divided into an outer, an inner, and a country zone, in which the height of buildings allowed progressively decreases, and the amount of the lot that must be left free of buildings progressively increases. In each of these zones are residence, factory and mixed sections. In the residence sections, factories are so discouraged as to be practically forbidden. In the factory sections, situated along the railroads, the harbor, and out of the city in the direction so that the prevailing winds will blow the smoke away from the city, residences are forbidden. In the factory sections, the restrictions on height and amount of lot covered do not become progressively greater. The mixed sections are near the factory sections, and there, too, under certain mild restrictions, many sorts of manufacturing are permitted.

In the residence section a space between neighboring houses of about 10 feet (three meters) in the inner zone and a third more in the outer zone is required. Groups of buildings are, however, allowed with a somewhat less proportionate amount of free space for the group as a whole.

Certain parts of the newly added territory of the city, beyond all the other zones, and forming a zone by itself, have been reserved for a villa section, in which only country houses are allowed.

In all these zones the amount of the lot that must be left free progresses, until, in the villa section, it is seven-tenths of the entire lot. Thus, also, the permissible height decreases to about 53 feet (16 meters) and the number of stories to two. This does not include the roof story and the actual roof, which together, in this zone, must not exceed about six feet (1.8 meter) in height. In no case, however, may the house exceed in height, except for the roof story and roof, the width of the street on which it stands.

APPENDIX IV—RECORD OF TESTIMONY AND STATEMENTS IN RELATION TO NECESSITY FOR DISTRICTING PLAN

The intimate relation existing between a comprehensive districting plan and public health, safety and general welfare was testified to by numerous experts at the various public hearings held by the Commission. Public hearings were held on March 27th, 28th, 29th and 30th, and April 3d, 4th, 5th, 6th, 10th, 11th, 12th, 13th, 17th and 18th. Adjourned hearings were held on April 20th, May 4th, 8th, 9th, 10th, 11th, 15th, 18th, 22d, 24th, 25th and 31st. In addition to the testimony taken at these hearings numerous statements were presented to the Commission.

Only so much of this testimony as shows the relation of districting to the police power of the State is here reproduced. Originally much of the testimony was in the form of questions and answers. To economize space such testimony has been put in narrative form. In this new form it has in each case been submitted to and approved by the witness or author.

Organizations approve districting plan

Not a single organization opposed the adoption of a districting plan. Most of them adopted resolutions specifically endorsing the proposed plan. Others confined their activity to the recommendation of specific amendments to more adequately protect their particular localities. Most of these recommendations were for more stringent restrictions than those proposed. The following organizations either submitted resolutions endorsing the plan or were represented at the hearings:

Advisory Council of Real Estate Interests
Atlantic Avenue Business Men's and Taxpayers' Association of East New York
Automobile Dealers' Association
Bath Beach Taxpayers' Association
Bay Ridge and Fort Hamilton Citizens' Association
Bayside Park Civic Association
Bensonhurst Park Preservation Association
Broadway Board of Trade, Brooklyn
Bronx Board of Trade
Bronx Builders' Association
Bronx Taxpayers' Alliance
Brooklyn Board of Real Estate Brokers
Brooklyn Civic Club
Brooklyn Committee on City Plan
Brooklyn Heights Association
Central Fifth Avenue Association
Central Mercantile Association
Chamber of Commerce of the State of New York
Chelsea Neighborhood Association
Citizens' Union
City Club
City Hotels Association
Cloak and Suit Manufacturers' Association
Commerce Club of Brooklyn
Congestion Committee

Ditmas Park Association
Douglaston Civic Association
Dyckman Taxpayers' Association
East Side Neighborhood Club
East Tremont Taxpayers' Association
Erie Basin Board of Trade, Brooklyn
Evergreen Board of Trade
Fifth Avenue Association
Fiske Terrace Association
Flatbush Taxpayers' Association
Flatlands Board of Trade
Flushing Association
Flushing Business Men's Association
Greater New York Taxpayers' Association
Greenpoint Neighborhood Association
Greenpoint Taxpayers' and Citizens' Association
Greenwich Village Improvement Society
Harlem Bridge Betterment League
Harlem Neighborhood Association
Highland Park South Civic Association
Kensington and Parkville Improvement League
Kings Highway Board of Trade
Improvement Association of City Island
Investment Builders' Association
Merchants' Association
Midwood Manor Association
Midwood Park Property Owners' Association
Murray Hill Association
New York Board of Trade and Transportation
New York Building Managers' Association
New York Society of Architects
North Manhattan Taxpayers' Association
Parade Park Association
Park District Protective League
Progress Society, Far Rockaway
Prospect Heights Citizens' Association
Prospect Park Property Owners' Association
Prospect Park South Association
Queens Chamber of Commerce
Real Estate Board
Real Estate Owners' Association of the 12th and 17th Wards
Save New York Committee
South Brooklyn Board of Trade
South Midwood Residents' Association
Taxpayers Association of Dyker Beach Park
Tenement House Committee, Brooklyn Bureau of Charities
Throgs Neck Taxpayers' Association
Tremont Taxpayers' Alliance
Tuberculosis Committee
United Real Estate Owners' Association
United Civic Associations, Queens
Washington Heights Taxpayers' Association
Washington Square Association
West End Association

West End Board of Trade
West Side Children's Conference
West Side Taxpayers' Association
Women's City Club
Wyckoff Heights Taxpayers' Association

Financial institutions approve plan

Building operations are largely financed in New York by the life insurance companies, the fire insurance companies, the title companies, the trust companies and the savings banks. That these institutions strongly favored the districting plan is shown by the following petition to the Board of Estimate and Apportionment:

Whereas, The present almost unrestricted power to construct buildings to any height, over any portion of a lot, for any desired use and in any part of the city has resulted in injury to the health, safety and general welfare of the city and also to real estate and business interests, and

Whereas, Light, air and access have been impaired by high buildings, by failure to provide adequate courts and yards, by the proximity of inappropriate or nuisance buildings and uses, and

Whereas, It is recognized that there are strong social and economic forces that tend to a certain degree of order and segregation in building development, yet it is apparent that these natural forces are not strong enough to prevent haphazard development or to ensure the building of the city in a stable and orderly manner and with some regard for the amenities of city life, and

Whereas, Through haphazard construction and invasion by inappropriate uses the capital values of large areas have been greatly impaired, not only in the central, commercial and industrial sections of Manhattan, but also throughout the residence sections of the five boroughs, thus affecting the market value of real estate for investment purposes and creating an economic depreciation that is a hazard which must be considered by every investor in real estate, and

Whereas, This extra hazard decreases the net earning basis required to induce investment, consequently lessening the capital values throughout the city and affecting not only the individual owners of real estate, but the large lending institutions, the municipal finances, and the general welfare and prosperity of the city, and

Be It Resolved, That with the some eight billion dollars already invested in New York City real estate and the certainty of added billions in the coming years, the lending institutions of the city, in conjunction with the property owners, endorse a plan of city building that will tend to conserve and protect property values because of the permanence and stability that can only be secured by a far-sighted building plan which will harmonize the private interests of owners and the health, safety and convenience of the public, and further

Be It Resolved, That it is the sense of those present at this meeting representing financial institutions, as well as such other representatives of the financial institutions as may wish to endorse this resolution, that the work and plans of the Commission on Building Districts and Restrictions be accorded hearty support.

The institutions which approved of this resolution are as follows:

Astor Trust Company
Bank for Savings in the City of New York

Bankers' Trust Company
Bowery Savings Bank
Citizens' Savings Bank
Columbia Trust Company
Commonwealth Insurance Company of New York
Commonwealth Savings Bank
Dime Savings Bank of Williamsburgh
Dry Dock Savings Institution
East Brooklyn Savings Bank
Emigrants' Industrial Savings Bank
Equitable Life Assurance Society of the U. S.
Excelsior Savings Bank
Fidelity Trust Company
Franklin Savings Bank
Franklin Trust Company
German Savings Bank of Brooklyn
Germania Fire Insurance Company
Germania Savings Bank
Globe & Rutgers Fire Insurance Company
Greater New York Savings Bank
Guaranty Trust Company of New York
Harlem Savings Bank
Home Life Insurance Company
Home Insurance Company
Hudson Trust Company
Imperial Assurance Company
Irving Savings Institution
Italian Savings Bank
Jamaica Savings Bank
Lawyers Mortgage Company
Lawyers Title & Trust Company
Liverpool and London and Globe Insurance Company
Long Island City Savings Bank
Manhattan Life Insurance Company
Metropolitan Life Insurance Company
Mutual Life Insurance Company of New York
New York Life Insurance Company
New York Savings Bank
New York Title Insurance Company
North British & Mercantile Insurance Company
North River Insurance Company
People's Trust Company
Postal Life Insurance Company
Royal Insurance Company
South Brooklyn Savings Institution
Sumner Savings Bank
Title Guarantee and Trust Company
Transatlantic Trust Company
Union Square Savings Bank
United States Mortgage & Trust Company
West Side Savings Bank
Williamsburgh Savings Bank

STATEMENT BY THOMAS ADAMS, TOWN PLANNING ADVISOR, COMMISSION OF CONSERVATION, OTTAWA, CANADA—APRIL 5, 1916

Effect of New York's example on other cities

In Canada we feel that New York has been responsible, owing to the example which it has set, for the high buildings in our cities. We are looking to-day to the new tendency in New York in the hope that our cities will follow your example of providing greater restrictions on height. We have not the excuses for high buildings that you have in New York.

Town planning in Great Britain and Canada is one of those questions that grows stronger in its appeal to the business man as it is taken up by local authorities, and as research progresses. Undoubtedly the latter starts out to study it with the assumption that it is purely an aesthetic question—the proposal to use the police power to restrict the rights of private property in the interests of the public. But it does not take him long to discover that both public and private interests are closely identified and that reasonable restriction of the use of property is in the interest of all parties.

Importance of restricting vacant areas

The question of controlling development in those parts of your city which are only partially developed is of importance and requires serious consideration. I do not know whether it would be possible for your proposals to be carried out over wider areas so as to include land which is not yet subdivided. So far as our town planning work in Britain and Canada is concerned we are dealing primarily with areas that are still undeveloped and with those that are "in course of development." We proceed on the principle of the Jesuit who in his wisdom said, "If you give me a child until he is eight years old you can have him for the rest of his life." We feel that the really important thing is to get hold of the suburb before it is developed. Much of the older portion of the city can only be improved over long periods of time by gradual reconstruction. Your proposals are needed to help in directing that reconstruction. But I think your work should be extended to wider areas in order to get the restrictions applied to vacant land before building is begun. In getting hold of the suburbs that are starting to develop and applying the same principles to the open land that you apply to the built-on land in the city, the result will be that you will be able to apply restrictions which will accomplish something nearer to your ideals. It is easier to prevent than to cure. You will not be required to compromise with existing vested interests. Owners of real estate themselves will not only be anxious to agree to something that gives safety and health but even to what we in Britain, call "amenity" in plan and surroundings. I am glad to give expression to our interest in the work you are doing and am sure that the influence of your work is not confined to New York.

Town planning law in Canada

When our parliament passes a law it does so with recognition of the English Bill of Rights. The whole constitution of Canada is framed on what you perhaps would call the unconstitutional constitution of Great Britain. It is not a fixed constitution, but a constitution capable of readjustment and alteration by parliament itself.

Parliament in Britain and Canada recognizes the principle that private property shall not be taken for public use except with just compensation. But it does not necessarily allow an abuse of private property and permit a

claim to be made for compensation because of an owner being prevented from deriving advantage from that abuse. There are cases in which land is used for building development to such an extent that it becomes—not use of land—but abuse of land—or abuse of the right use of land. I think those who advocate the single tax say there are two uses of land, one is "non-use" and the other is "use." We have, however, three forms of use—one is use, the other is non-use and the third is abuse. What we call "improving" land or "developing" land may actually result in an injury to the public. We have to recognize the rights of the man who claims compensation for restrictions on his use of property; but he should not, for instance, be permitted to demand air space from other property abutting thereon as a right. He ought not to be allowed to claim compensation on the ground that he is prevented from using the public space on the street or open space on an adjoining site to provide him with light. Surely he may properly be required to use his own property for the purpose of providing his own air space and light. I speak of what appears to me to be equitable although it may be without regard to what is legal.

Our Parliament recognizes constitutional guarantees of the equal protection of the laws. I don't think there is very much distinction between your treatment of private interests in property and our own, except that probably we are able to secure by general law what you have to secure by police power and you have probably to educate your courts with regard to the interpretation of the matters that come within the scope of the police power. You do not appear to have the same power to revise and remodel your law to suit changing conditions.

In Great Britain and Canada a person cannot obtain compensation for being prevented from doing anything to contravene a town planning scheme after a given date. There is no appeal in that matter above the department of the government. The following subsection which appears in our town planning acts shows how much jurisdiction is vested in the department, and therefore the reason why the matter does not come before the courts.

"Property shall not be deemed to be injuriously affected by reason of the making of any provisions inserted in a scheme, which, with a view to securing the amenity of the area affected by the scheme, or any part thereof, or proper hygienic conditions in connection with the buildings to be erected thereon, prescribe the space about buildings, or the percentage of any lot which may be covered with buildings, or limit the number of buildings to be erected, or prescribe the height, character or use of buildings, and which the department,[1] having regard to the nature and situation of the land affected by the provisions, considers reasonable for the purpose of amenity and proper hygienic conditions." The right of our town planning authorities to name restrictions has never been contested in the Courts, but town planning is still in its infancy.

Where I think we seem to have an advantage in our town planning acts in Canada is that the provinces have full power to deal with municipal matters and questions affecting land. They pass an act and there is no appeal from that act to any federal court. There is, however, an appeal to the provincial Parliament to decide differences between the municipality and the owner. For instance, in a town planning act a ministerial department of the province—say the department of municipal affairs—becomes the controlling authority in regard to planning in that province. The municipalities have to apply to that department for the right to prepare their

[1] Provincial Department of Municipal Affairs or Local Government Board.

town planning schemes and for approval of the schemes. As already stated (see quotation above) compensation cannot be claimed and there can be no appeal on the question of restricting the number of buildings to an acre or in fixing the character or height of buildings *if* the provincial department is satisfied that the restriction is *reasonable* for the purpose of "amenity" or "hygienic conditions."

Districting regulations in Canada

There are districting regulations in one or two cities like Toronto and Hamilton. This is a matter that is subject to the owners presenting a petition and the majority being in favor of the proposal. It is done on the initiative of the owners who may apply to have restrictions placed on property. But we have no proper or adequate system of districting.

Objects of town planning

Both in Britain and in Canada, town planning legislation has for its principal objects, health, safety from fire, convenience, amenity and general welfare. Safety from fire is particularly important in Canada. We pay, I think, six or seven times as much for fire prevention and insurance in Canada as in England. The cost of maintaining fire appliances and fire insurance, I think, is two dollars per capita more than in England. This is largely due to the absence of the control of the character of buildings and the regulation of space surrounding buildings. For instance, in an English city you must put a certain amount of space around your building and that must be paved or graded with fireproof material.

Progress of legislation in Canada

Four out of nine provinces have town planning acts. One of these has a compulsory act for the whole province, and no future development can take place there unless it is part of a scheme. In Manitoba they have just passed an act. In Saskatchewan the Town Planning Bill has passed its first reading. I expect that by this time next year the whole of Canada will have town planning acts. These acts will enable local authorities in all parts of the Dominion to control the use and development of vacant land and also land "in course of development," in a way which will effectively secure health, convenience and amenity. The acts do not apply to land already built upon unless such land has relation to vacant land or partially developed land. We use the words "land in course of development" to distinguish it from vacant land on the one hand or fully built upon land on the other. Land already "built upon," *i. e.,* fully developed, has usually to be dealt with outside of town planning schemes, under what are known as improvement schemes.

There is a scheme being prepared for St. John, New Brunswick, covering twenty thousand acres, which includes ten thousand acres inside the city and ten thousand outside the city. The City of St. John has prepared the whole scheme and it is going outside its own territory. If you restrict a city such as New York in order to prevent bad development within its limits, you may indirectly encourage bad development just over the boundary of the city unless you also restrict the area outside. That is why we insist on co-operation between adjacent municipalities under our acts.

If in St. John, after a certain date, a few months notice being given, any owner builds a house which contravenes the proposed scheme he has

no claim for compensation if the authorities require him to pull down the building or alter it to fit in with the scheme.

In England a man erected four shops under a scheme. It was stated that he should put his shops seven feet from the edge of the street, instead of which he put them only three feet from the edge. He had a comparatively shallow lot. The shops projected four feet in front of the building line. I had to report on that scheme and reported that he should pull them down to the extent of four feet. He appealed first to the Local Government Board, then to Parliament, and it was finally settled that he had to pull down to the four feet, but they gave him twelve years to do so, so that he could draw the rental for that period to compensate him for his loss. There is no intention to allow any owner to defeat the principles of these acts. In this case the authorities were specially generous because it was the first offense under a new statute.

I would like to see more done to improve both cities of Niagara Falls. In the matter of Victoria Park, we in Canada have done a great deal, but I would like to see more effort made on both sides of the river to improve and beautify the surroundings. It requires co-operation between our governments.

The British town planning acts have not been long enough in operation to allow a scientific study of the effect of town planning on health. But in Bourneville, Letchworth and elsewhere it has been shown that the death rate need not be higher than nine per thousand. The children on the average as compared with those of the same age in the slums are proved to be heavier and of greater height.

The proportion of eligible men fit for military service in Britain is greater in the healthy districts than in the unhealthy areas. There is a well known case, which will probably be remembered, in which 8,000 out of 11,000 were rejected in one instance for the army on account of physical defects due very largely to the social conditions under which they lived. This happened in Manchester, and there are conditions on this continent as bad as those in Manchester. Proof of the deteriorating influence of the slums is not needed at this time of day.

In Britain serious efforts are being made at great public expense, to insure that the mistakes handed down to the present generation as the result of haphazard development in the past, may be avoided in the future. It is essential to prepare plans and schemes on an economic basis so that the remedy they provide may be effective and can be made of general application. To have a fanciful plan that is too expensive to carry out is worse than having no plan; the stimulus it provides to the imagination does not have a sufficiently lasting effect to enable it to be of real benefit and may end in a reaction against any form of planning. You are starting in the right way in New York so far as the built upon areas are concerned, but I hope you will next take up the question of preparing a scheme for the thousands of acres of vacant land within ten miles of Manhattan Island.

Statement by Ancell H. Ball, Chairman, Board of Directors, Fifth Avenue Association, March 28, 1916

Protection of Fifth avenue

The Fifth Avenue Association, of which I am one of the representatives, has a membership of over six hundred, representing millions and millions of dollars of real estate in the retail section between 23d and 59th streets. The membership is formed of the largest property owners, retailers,

hotel owners and jewelers in the City, as well as other prominent business men.

New York as a city is looked upon by the whole country as one whose example should be followed in matters of commercial interest as well as in civic affairs, and the example we set will have its effect upon the whole country. What is now done by us will leave its imprint on the future development of most of the large cities in the West.

The section alluded to is probably the greatest retail section in the world. Already haphazard building has tended to reduce taxable values for the City and to largely destroy the same values for the owners of property. It is high time that some real constructive idea of development for a city such as this should be adopted. To permit the selfish interests of an individual to interfere with the growth of the City as a whole is entirely unreasonable. Such selfish interests should be subordinated to the interests of the majority. No business man would consider seriously today attempting to run his business successfully without some well defined and preconceived idea as to what he wished to accomplish. No more can a city like New York grow as it should without some such definite purpose in mind. I noticed in the papers this morning that a few individuals opposed the plan proposed by your Commission, but such opposition seems so individual and entirely personal that in my mind little consideration need be given it.

If New York is to maintain its supremacy it must be developed along constructive lines, and this cannot be done, if not done under the proper control. It is of vast importance to the City that the value of real estate be conserved, and already we have many examples showing how entire districts and areas may be depreciated.

If the ideas as laid down by your Commission are followed values will return and the consequent increase in revenue from taxes is an assured result. This is of immense benefit to every dweller in the City of New York whether he leases, or owns property, or pays rent. Manufacturing and factories should absolutely be confined to one area, and in this area modern loft buildings suitable for the workers as well as the owners should be erected. Buildings in which the workers could live could be built in the immediate vicinity, affording greater conveniences to everyone and lessening the constantly increasing congestion in our subways and surface lines. It is inconceivable to me that anyone who has the interests of New York at heart could, under any circumstances, be in favor of haphazard building as compared with that along constructive lines.

I sincerely hope that the people of New York will make it their personal affair to do everything that they can to aid this great constructive work that your Commission is endeavoring to have made a law.

Statement by Albert S. Bard, Secretary, The Municipal Art Society, March 29, 1916

Districting necessary for orderly development

Of the general plan to district the city into residential, business and industrial districts, the Society has no criticisms to make. It believes that the principle of specialization by regulation lies at the foundation not only of any orderly development of the city, but of a conservation of property values and the creation of satisfactory living conditions. We especially approve of the creation and protection of exclusively residential districts.

Safeguarding of parks

As to whether the particular regulations proposed go far enough, we would like to reserve our opinion for the present. We are inclined to believe that certain of the restrictions should be substantially increased, where present developments do not seem to block the way. In this connection, we would urge particularly a more careful safeguarding and regulation of property surrounding parks, and especially small parks, which find their highest values as residential neighborhood centers.

Aesthetic considerations

This society greatly regrets that the present constitutional situation prevents the Commission from giving weight to aesthetic considerations, and that the proposals are necessarily based wholly upon considerations of public health, order, convenience, and the stabilizing of property values. This society recognizes, however, that the introduction of orderly development in place of the present chaos will have a tendency to improve the appearance of the city, both directly and indirectly, and that to that extent the proposed system is better than the existing lack of system also from the aesthetic point of view. We think it, however, a great misfortune that the city is not in a legal position to make a direct attempt to conserve aesthetic values in places of exceptional beauty like Riverside Drive, the neighborhood of parks and the like, where aesthetic values are in fact large factors in the desirability of the locality. But we recognize that that effort must wait. Americans generally are far behind many other nations in realizing the value of beauty as a municipal asset expressible in dollars, to say nothing of its daily contribution to the happiness of the citizen.

Statement by Edward M. Bassett, May 31, 1916

Ineffectiveness of restrictive covenants

The history of private contractual restrictions in the State of New York has not been such as to warrant the hope of permanent help therefrom. Private restrictions are effectual only between the landowners who enter into such covenants with one another, or, as is more usually the case, the owner of a considerable tract of land will sell portions subject to restrictions enumerated in the deeds. In the latter case the covenants run with the land, as between owners who derive their title from the same source that imposes the restriction.

These restrictions have usually been imposed to preserve localities from nuisances, or from the invasion of business of any sort in residential localities; to prevent the invasion of industry and business in residential localities; to prevent the sale of liquor, and more latterly to insure the permanence of private residence neighborhoods, in some cases requiring detached residences. In developments that are intended to be for high-class residence only, there have sometimes been restrictions requiring set-backs, and one-family detached residences of a cost not less than a certain amount. Restrictions against flat roofs have been common.

Restrictions imposed in Kings and Queens Counties thirty-five or forty years ago were often put into the form of conditions; for instance, a deed would provide that the land was conveyed on the condition that liquor should never be sold on the premises, or that the premises should never be used for business. As the violation of a condition is forfeiture, these conditions rendered land almost unsaleable. After the title companies began their work, they, as a rule, required the release of these conditions, or their

change into covenants before they would sanction the title. During the past twenty-five years, in both of the above counties, restrictions have been by covenants running with the land. A violation of these covenants can ordinarily be prevented by injunction, or, after a building in violation of them has been constructed, damages can be obtained against the violator. These covenants have sometimes been in perpetuity. The trouble with perpetual restrictions has proved to be that the original owners could not foresee the growth of the city or the tendency of controlling uses. Sometimes a locality that has been perpetually restricted for residences has become surrounded with business, so that the character of the locality has changed; in such cases the courts have frequently held that restrictions have become inoperative because of the change of character of the neighborhood. The process of change has produced a turmoil in every case where the supposed protected landowner has for a series of years been uncertain whether his property would be protected by the courts or not. This has led to lack of improvements, lack of proper upkeep, and to the removal of people from the locality who would have stayed if the prospect was more certain.

More frequently, however, the restrictions have been for a certain number of years, the date being expressed when they would lapse and become void. The courts have not been so ready to set aside these time-limit restrictions because of change of character of neighborhoods. They have, however, been an uncertain and incomplete protection for a permanent class of structures. If the locality is a small one, the surroundings sometimes grow up in a way that renders a small locality unable to carry out the restrictions to advantage. Then, too, one owner will violate the restrictions in a slight degree, the next owner violates them a little more, and when a gross violation occurs the property owner applying for an injunction will be met with the allegation that he has acquiesced in the violation of restrictions in former cases to such an extent that he has now lost the equitable assistance of the court. In this way, restrictions are sometimes virtually abolished before the time limit has run. While this gradual change is going on the locality is in a chaotic condition and owners are afraid to build in a permanent way. Another drawback of time-limit restrictions is that within the last five or eight years of the restrictive period people who have vacant land will hold it out of the use required by the restrictions, hoping that when the restrictions expire they can build in a way that will exploit the land which is already improved. When, therefore, prospective purchasers come into a restricted locality and see corner lots or desirable locations unimproved, they are thereby warned not to buy or build in that locality because they foresee that the land that is being held out of use will probably be built up with structures that will be injurious to the surrounding buildings.

Exploitation of restricted areas by unscrupulous developers

A tendency has grown up within recent years for land developers to place short-time restrictions on their land, hoping that they can bring about a high class of dwellings on that which is sold. Then the developer himself holds part of the property until the restrictions expire, expecting to get a higher price for the parcels which he has retained, thus exploiting his own prior customers. This method is akin to the method adopted by some developers who have sold parcels to purchasers who will covenant to erect high-class detached one-family dwellings. When the owner has sold practically all of his property except the corners, holding those entirely unre-

stricted, he will sell the corners for apartment houses, obtaining higher prices, because the surrounding property is built up with a large amount of open space. In one case this practice went so far that the owners of the corner apartment houses claimed that their predecessor in title placed detached house restrictions upon the surrounding land for the benefit of the future apartment houses, and that the owners of the private houses could not, on the ground that the character of the locality had changed, build up their land with apartment houses in place of the detached houses.

Short term private house restrictions have throughout Flatbush and certain portions of Queens been an invitation for the premature building of sporadic apartment houses. In some cases the apartment house has actually been built before the neighborhood had reached an apartment house stage, because the unbuilt-up corners now freed from restrictions offered an opportunity to exploit the detached house locality. Many people will go a long way out into the suburbs to live in an apartment house if they can have the surroundings of detached houses, when they would not go to apartment houses in a locality so far away that was entirely built up with apartment houses.

Therefore, I say that, on the whole, private restrictions have failed in preserving localities for designed uses during the life of the structures that are erected under those restrictions. Their helpfulness is only temporary. Probably it will be the effect that if no method of municipal restriction is put into force by the city to preserve to some extent what has been accomplished by private restrictions, the effect of private restrictions, as thus far practiced in parts of the city, will be negligible.

In general, the main drawback of private restrictions as practiced in this city is that the surroundings of the restricted locality is built up quite regardless of the required growth of the restricted district; then the edges of the restricted district are gradually hurt and in some cases the restrictions result in a financial loss to those whom they were intended to help. Under the zoning as sought to be done now under charter amendments, entire localities that are suitable for a given use will be appropriately restricted, so that the constant encroachment of unsuitable uses on the edges will be largely prevented.

It has come to be the common saying in the four outlying Boroughs of The City of New York that private restrictions do not restrict. To my personal knowledge many Brooklyn and Queens residents have moved outside of the city, because they say the only protection of their home is to buy a fair-sized plot of ground outside of the five-cent-fare zone. There is a gradual and constant migration of well-to-do people to counties and states near Greater New York on this account. Some say that a man is a highly speculative person who will build a private house in Greater New York that costs over $30,000.

Damages against a violator of a covenant are collected by an action at law by the landowner within the restricted district who was injured by the landowner within the district who violated the covenants. These damages are very hard to prove and extremely uncertain. Almost no cases are brought on this ground in the City of New York. The cost of taking such a case into court would, in most instances, exceed the damages that might be collected. There is no machinery for enforcing private restrictions except through the watchfulness of surrounding property owners. The city government gives no help. The only procedure for enforcing such provisions is by an appeal to the court on behalf of property owners who consider themselves injured.

Advantages of municipal over private restrictions

One of the decided advantages of a districting plan, such as is now proposed by the Commission, is in the fact that it is watched and enforced by organized machinery which has facilities for inspection and follow-up work. The courts will be less likely to set aside individual parts of a general plan of restriction throughout the city than they would be to set aside individual private restrictions which bear no relation to one another. In general, the plans as proposed by the Commission will provide many of those things which private restrictions have attempted to provide in the way of safety, general welfare, comfort, amenity, convenience, agreeableness of surroundings, etc., and in a way which is likely to be permanently satisfactory. In particular, the general restrictions to be imposed under the police power, as proposed by the Commission, will solve the problems which arise from the failure of private restrictions as described above, in a satisfactory way.

STATEMENT BY L. E. BAUMANN, REPRESENTING THE GREENPOINT NEIGHBORHOOD ASSOCIATION, APRIL 19, 1916

Need of protecting parks from factories

The streets immediately adjoining McCarren Park should be restricted to the use of residences, churches and public buildings.

I represent an organization that for years has been doing a philanthropic and social work in Greenpoint. We find in our summer playgrounds, where we have 300 children per day, that the factories immediately adjoining are a detriment to our work; notwithstanding the fact that they extend to us the most hearty co-operation, there is danger in the trucks that must pass to and fro. There is a certain spirit of just simply "beat the game" that gets into the children. That develops when you have a factory there. When you can get children apart in their games and with their whole attention on their games, an attitude of respect and co-operation develops among them.

McCarren Park has become the greatest center for social work in the Greenpoint section of Brooklyn. The Park Commissioner has done a great deal for us, and games are played there in the open in summer. This recreation center is maintained all winter, and it has become a great factor in the social and philanthropic work of Greenpoint. It seems to us that the work ought to be backed up and kept in all its value for that district.

Now, there are girls who come there evenings, two and three hundred girls, who work all day in a factory. I know from long experience in settlement work that girls and men and boys, all of them, while they go to their work willingly, like to quit their work and get away from it at nights, and if you have the factories looming up around this park where they are going for their recreation, it detracts from the value of that pleasure. It is bound to. Greenpoint must be industrial for years to come. Still there are tracts of land lying available in sections of Greenpoint that would provide for all of the additions to industrial work for years and years to come, and it seems to me that there is no necessity of these factories congregating about McCarren Park.

Streets as play spaces

The Commission's plans provide a considerable number of the side streets restricted for residential purposes. This restriction will be of great

advantage on account of the fact that it leaves the streets more free as play spaces for the children.

This is a very important provision. We ran a street playground last summer and are contemplating one this summer, and we unfortunately decided on a street that had a large manufacturing plant located on it and before the summer was out we had to change that street playground. There were streets all around us that were given over to residences and those streets were filled with children. There was not nearly the danger to life and limb on those residence streets. An association such as ours can provide for only a few of the thousands of children on the streets of Greenpoint, and I think the restrictions on these streets very excellent indeed from the standpoint of protecting the children.

Statement by J. Bernstein, Traffic Expert, Fifth Avenue Association, March 30, 1916

Traffic counts in Fifth avenue section

I wish to state with the utmost emphasis that all the statistics and facts quoted here have been gathered with no thought to use them as arguments for or against the limitation of building heights or the restriction in use of buildings. All this material was collected solely from the point of view of traffic study. Some of the figures quoted are part of a traffic count taken during the month of November, 1915, by the traffic division of the Police Department. Other counts were made by the New York Railways Co., and by the Citizens' Street Traffic Committee; while the detailed traffic statistics contained herein were gathered under my direction and supervision, to be used in determining the advisability of street widenings, the removal of building encroachments, the regulation of traffic and the possibility of subsurface crossings for pedestrians. These counts have been taken at various times during the last three years.

Traffic conditions at various important points are reflected by the following figures ascertained by the Police Department between the hours of 8:30 A. M. and 6:30 P. M.:

FIFTH AVENUE

	Vehicles	Pedestrians
Fifth Ave. and 14th St.	11,927	45,525
Fifth Ave. and 20th St.	13,240	73,100
Fifth Ave. and 23d St.	11,392	48,411
Fifth Ave. and 31st St.	13,490	72,000
Fifth Ave. and 32d St.	13,760	74,610
Fifth Ave. and 33d St.	14,120	78,200
Fifth Ave. and 34th St.	14,360	146,300
Fifth Ave. and 38th St.	15,460	124,250
Fifth Ave. and 42d St.	18,800	137,780
Fifth Ave. and 59th St.	14,220	24,888

SIXTH AVENUE

	Vehicles	Pedestrians
Sixth Ave. and 14th St.	8,662	51,875
Sixth Ave. and 23d St.	8,020	106,829
Sixth Ave. and 34th St.	9,441	102,480

BROADWAY

	Vehicles	Pedestrians
Broadway and 23d St.....	1,964	85,800
Broadway and 24th St.....	9,000	62,900
Broadway and 25th St..	4,760	63,310
Broadway and 34th St.....	12,800	101,000
Broadway and 42d St.....	19,650	90,370

While these figures do not show the direction in which traffic moved, they do present a sufficiently vivid picture of the congestion which is the rule at these points. It is noteworthy that near the streets where the number of high loft buildings is either small or where they are not tenanted or only partly tenanted, the number of vehicles and pedestrians passing the observer is considerably smaller than where the side streets house loft-buildings filled with factories. Compare the traffic on Fifth Avenue and 14th Street, Fifth Avenue and 23d Street with that on Fifth Avenue and 20th Street or Fifth Avenue and 32d Street and you will see the difference.

Busiest corners on Fifth avenue

To visualize the crowds finding their way during ten hours to given spots on Fifth Avenue we must realize that the 146,360 people counted on Fifth Avenue at 34th Street exceed the whole population of the City of Worcester, Mass. The 124,250 counted at 38th Street exceed the total population of Omaha, Neb. The population of Grand Rapids, Mich., is less than the number of pedestrians passing Fifth Avenue at 42d Street.

On January 26, 1916, between 8:30 A. M. and 6:30 P. M. 8,662 vehicles went south on Fifth Avenue at 42d Street, while 7,138 went north; 4,716 went east, and 3,567 went west. Of the vehicles on Fifth Avenue less than 4 per cent are of a commercial nature; on 42d Street 33 per cent are of a commercial character.

Proportion of light and heavy vehicles

South from 42d Street on the side streets this ratio of commercial vehicles gradually increases. On 38th Street for instance, the ratio is 40 per cent; on 35th Street 42 per cent; on 33d Street 54 per cent; on 32d Street 58 per cent; on 26th Street 61 per cent, and on 20th Street 70 per cent. How much delay is caused by the trucks delivering and receiving goods to the high loft buildings can be seen by considering the fact that out of a total of 1,425 commercial vehicles passing through 32d Street between Fifth Avenue and Broadway, 612 stopped either parallel to the curb or backed up against it. Perhaps the delays can be measured by comparing the total number of vehicles counted in this block with the total number of vehicles passing through 46th Street between Fifth and Sixth Avenues. The count on 32d Street showed exclusive of omnibuses, 1,204 passenger vehicles and 1,425 commercial vehicles. The count on 46th Street showed, exclusive of omnibuses 4,814 passenger vehicles and 478 commercial vehicles. Although 46th Street is of the same width as 32d Street it accommodates easily double the number of vehicles without crowding and without the supervision of a traffic policeman. But 46th Street has no high factory loft buildings, while 32d Street has a large number. A comparison of 38th, 37th and 35th Streets with 47th, 48th and 49th Streets shows the same situation. Instances like these could be multiplied. It is, however, sufficient to call attention to the fact

that wherever there are tall buildings used as factories the police commissioner finds it necessary to designate as many men as are available for duty in the side streets in order to prevent the snarls and jams of vehicular traffic.

Street car congestion

The street car, elevated and subway congestion in the evening rush hour has given much concern to the Department of Health. A single trip along Fourth, Sixth and Seventh Avenues between 6 and 6:45 P. M. between 24th and 30th Streets for instance, will reveal hundreds of human beings pushing and shoving and actually fighting inspectors, motormen and conductors of the street cars in an effort to board the already packed cars. The same condition exists on 8th and 14th Streets west of Sixth Avenue, and on 14th Street and 8th Street on Fourth Avenue. A mere glance is sufficient to identify these crowds as employees of the garment factories located between Fourth and Seventh Avenues from 24th to 30th Streets.

Elevator congestion

As to crowding in elevators, consider for a moment that some of these loft buildings employ as many as 3,000 to 3,500 people. All of these factory employees are compelled to ride in the freight elevators—usually two, exceptionally three in number. It does not take much imagination to conjure up before one's eyes the scenes at the beginning and the end of the lunch hour, or at the hour when all of them stop work for the day.

In this connection it is to the point to narrate an incident which occurred on October 9, 1915, Fire Prevention Day. The building in question at 105 Madison Avenue is a new 20-story loft building of the best type. The Joint Board of Sanitary Control which exercises well defined authority over the garment factories located in that building, had decided to have a fire drill on some floors of that building. Let me interpolate right here, that on no occasion has the attempt been made to have the fire alarm signal sounded throughout the whole building. On the 9th of October it was proposed to have a fire drill on one or two floors. The subject was broached to the proprietors of these shops and they promptly declared that unless they were indemnified and reimbursed for any and all liabilities, which they might have to assume in case of an accident happening to any one of their several hundred employees, they would not consent to have a fire drill, because they considered it too dangerous for their employees to descend the stairs in large numbers. Naturally no fire drill was held. What would happen if the 3,000 factory workers in that building should try to get to the street by means of the stairs I leave to your imagination.

Statement of J. Bernstein, Traffic Expert, Fifth Avenue Association, April 29, 1916

Congestion of factories in New York City

Factories tend to congest in New York City because the greater part of European immigration comes to this port and cheap foreign labor is plentiful. This is especially true in the garment industry in which about 80 per cent of the operatives are Russian Jews and 20 per cent Italians. A few of the foremen and cutters are of other nationalities, but the vast majority of the employees have been in this country a relatively short time. The industry was originally organized on the cheap-labor, sweat-shop system, but in late years there has been a tendency on the part of the better

class of manufacturers to provide, and on the part of the unions to demand, reasonable wages and sanitary shops.

Distance factory workers must travel

The workers in the factory districts of Manhattan do not as a rule live within walking distance of their work. A large number of the artificial flower and feather factories are located within walking distance of their employees in the vicinity of Washington Square and during the last three or four years clothing factories have been erected east of the Bowery where the workers live. Also of late with the removal of the big printing plants to the west side, considerable tenement house space has been let to employees in the printing trade on Eighth and Ninth Avenues and in the side streets from 25th to 42d Streets on the west side.

When the garment industry was organized some 15 or 20 years ago the factories were located on and around Broadway between Bleecker and Canal Streets. In those days the employees of these factories all lived within walking distance of their places of work and it was customary for them to go home for their lunches. The multiplications of garment factories and their gradual removal northward diminished the chances of the operatives to live near the places of their employment. When the garment factories congregated around Fifth Avenue in the center of the City, there remained, of course, no possibility for the workers to live within walking distance of their factories. To-day, the bulk of garment workers live in the Bronx, on the lower East Side, Williamsburg, and even as far away as Brownsville.

The removal of garment factories to the district below 14th Street would save a great deal of traveling by the workers on street cars and elevated trains and about 40 per cent of the garment workers would live within easy walking distance of their places of work. About 40 per cent would save two carfares per day and could reach their places of work within the average of 15 minutes' walk. The ones living in the Bronx or Williamsburg would save on the average a walk of one mile—the distance they have to walk to-day from the elevated or subway stations on the East Side of the city to the factories west of Fifth Avenue.

Unsatisfactory luncheon and recreation facilities

There are not and cannot be adequate luncheon facilities in the crowded factory districts near Fifth Avenue. There are about 50,000 factory employees in that district and as a rule they visit restaurants only during the lunch hour from 12 to 1 p. m. At other hours there is practically no demand for the service of food. The average expenditure of money for lunch on the part of the garment workers is less than 15 cents—a sum inadequate to give a fair return on the cost and investment of a restaurant. The item of rent alone is prohibitive and the only lunch places patronized are of the type which provide no seats for their customers. The workmen buy cheap and insufficiently nourishing food or bring some food with them from their homes. In both cases they are compelled to eat their food on the sidewalks or in the roadway and even with utmost care the streets are littered with refuse.

All luncheon places are overcrowded. It is not an infrequent occurrence that in a place where 50 chairs are provided for the lunchers as many as 200 crowd the place, packed tightly awaiting their chances of getting something to eat.

Some of the operatives could get satisfactory food in the better class restaurants of the vicinity. But, as a rule, they are either unable or unwilling to spend the 35 cents for which a satisfactory luncheon is served in the restaurants which are patronized mostly by office and retail store employees.

The food sold in the cheap places is of inferior quality and it is this food which is mostly bought by the operatives. In connection with the lunch question, it is important to note that those factory employees—like cutters, pressers, etc., who have to stand at their work do not get either proper food or rest during the lunch hour. Insufficient space in the restaurants where seats are provided, necessitates the hustling out of the lunchers at a rapid rate. The men, in order to smoke, have to stand or walk on the streets. While this is a relief to the machine operator who sits at his work the cutter and the presser get fatigued and according to some of the observant manufacturers their work in the afternoon falls below the standard of their work in the morning. A great deal of friction is caused by this between employees and employers, the former insisting upon a day wage, while the latter, in order to shift the consequences of the decreased efficiency of the workers, prefer a piece wage. Neither the employee nor the employer is really responsible for this decrease in efficiency—it is brought about solely by the overcrowding of the factory district.

Congestion on transit lines at rush hours

Work in all garment shops starts promptly at 8 in the morning and ends at 6 in the evening except on Saturday, when work stops at 12 o'clock noon. During the busy season, overtime work is performed from 7 to 9 in the evening. Thus it will be seen that of necessity all the employees use the transit lines about the same time and since they congregate within a few blocks in their respective home districts the transit lines carry them all practically the whole distance together. On this account the cars are crowded to the limit of their capacity morning and evening. The Board of Health has encountered great difficulty in attempting to prevent even greater overcrowding.

Actual timing along Sixth Avenue and Fourth Avenue has proven that 15 minutes' wait is the average for the individual would-be passenger between 6:15 and 7:15 o'clock. At the 14th Street and 8th Street intersections, the workers waiting for the crosstown cars to take them to the lower East Side or Williamsburg stand occasionally for half an hour. Twenty minutes is the average wait between the hours of 6:30 and 8 in the evening.

Sidewalk congestion

According to a count taken on September 14, 1915, the only one of which I have knowledge, 2,454 persons passed the observers on the east side of Sixth Avenue from 26th to 27th Streets in the half hour from 12:20 to 12:50 p. m. To this number should be added 617 persons who were counted standing still, making a total of 3,071. Unfortunately I have no corresponding figures for the congestion in the factory districts. None of the large factories in Manhattan, except perhaps the National Cloak and Suit Company of 207 West 24th Street, has any data showing the places where their factory employees live nor have any maps been prepared to show such facts.

Rest rooms and welfare work in factories

In the waist and dress industry most of the better class manufacturers provide rest rooms, lunch rooms and facilities for preparing simple food

for their employees. The bulk of the employees are women, and the Labor Laws prescribe certain definite rest room and dressing room facilities. There is practically no follow-up work for convalescents. In a very few rare instances the employers contribute a share to the sick benefit funds of the employees. Perhaps half a dozen concerns furnish the services of a trained nurse in the shops and for visits to the homes of the operatives; but on the whole the efforts of the manufacturers along these lines are a negligible quantity. In justice, however, it must be said that the Labor Unions do not look favorably upon any sort of welfare work on the part of the employers. The Unions themselves furnish medical attendance, hospital or sanitorium treatment to their members; they take care of their sick and provide free periodical medical examinations of the workers. As far as the male operatives are concerned, except perhaps in one or two instances, absolutely nothing is being done by the manufacturers to provide lunch or rest rooms or any kind of welfare or educational advantages.

The Manufacturers' Association and the Unions of the garment workers maintain conjunctively and on equal terms the Joint Board of Sanitary Control, an organization which looks after sanitary conditions in the shops and has done a great deal toward raising the standard of hygiene, ventilation and lighting of the garment factories.

No data has been prepared so far as I know to show the relationship between fires in the factories and the congestion of factory workers in such buildings, but it is possible that the greater the congestion, the more danger there is from illicit smoking. No time studies have been made to show how long it would take to get operatives out of tall factory loft buildings in case of fire or panic.

The prevailing opinion of fire chiefs and other fire experts is that in order to prevent loss of life a building should be emptied in a maximum interval from between three to five minutes from the discovery of the blaze. Garment factories are filled with highly inflammable and dense smoke-producing materials. According to Dr. Price's experience it would need from five to ten minutes to empty a 12-story building where there are at least two or three exits—a condition which is rather the exception, as the majority of buildings are not provided with three exits. It is, therefore, probable that in case of fire or panic the danger to the garment operatives would be very great.

In the more modern buildings provided with increased elevator facilities, and where the factory employees are permitted to ride on the passenger elevators at the end of the working day, and where special employees' elevators and freight elevators are also engaged in the transportation of employees from the working floors, the whole building is emptied in between 10 and 20 minutes, depending upon the height of the building and the number of people employed therein.

In the older buildings, however, the elevator installation is woefully inadequate. A large percentage of the employees are compelled to walk down the stairs, and 25 to 35 minutes usually elapse before the last employee reaches the street.

In factory buildings erected within the last three years, however, it is the exception that anyone walks down from the fourth or fifth floor, but in the older buildings people come down by way of the stairs even from the tenth floor. The average height from which people walk down is about six stories. The time it takes to get all the operatives out of a building by means of the elevators alone depends entirely upon the type of building.

The Waldorf Building, for instance, on West 32d street and West 33d street, has been emptied by using all elevators in less than 8 minutes—the average lapse of time there is 14 minutes. The older buildings with highly insufficient elevator capacity take from 20 to 40 minutes, if the elevators alone are used.

In the modern building the elevators are of the rapidly moving type, have roomy cars, while in the old buildings the elevators move slowly and do not accommodate more than ten persons on each trip in each car.

Freight elevator congestion and traffic delays

In modern buildings the freight elevators are more than adequate to handle the raw materials and goods in the garment industry, but blockades occur when freight is delivered to or shipped from various floors simultaneously. No freight can be handled in the morning hour or during lunch time because all the freight elevators are crowded with operatives going to their places of work or going out for lunch.

Truckmen wait from 15 minutes to one hour and a half, according to the time of the day when they make their deliveries. It is impossible to use the freight elevator before 8:15 A. M. and between 12 M. and 1:15 P. M.—the freight elevators are then busy transporting the workers. Outside of these periods the fact that the incoming and outgoing freight is of relatively small bulk, but comes from a variety of sources and goes to a multitude of destinations, leads the individual truckman to consider it quick work if not more than 45 minutes elapses from the time he is ready to transact his business until he has finished it. There are occasionally from half a dozen to a dozen truckmen waiting at the same place to deliver or to receive goods, the number usually depending upon the height of the building and the number of concerns doing their manufacturing there.

Traffic blocks, lasting from five to twenty minutes, occur quite frequently. As far as there are men available special traffic posts are maintained by the Police Department in the streets lined with tall factory buildings. These policemen are kept busy straightening out the multitude of traffic tangles caused by the large number of trucks engaged in receiving or delivering goods to and from the factories.

Since most of the warehouses and practically all railroad and coastwise steamship freight terminals are located at the waterfront in the lower part of Manhattan the length of haul would be materially reduced by having the factories farther downtown and nearer the waterfront instead of having them centrally located as they are now.

Percentage of floor area devoted to manufacturing

Regarding the percentage of floor area usually required for manufacture, I might say that I know of no department store which uses even as much as 15 per cent of its aggregate floor space for factory purposes. Dressmakers and milliners often need 25 per cent. of their floor space for manufacturing; custom tailors use a little less. In a few instances dress and millinery houses, doing exclusively a retail business, occupy at the present time more than 25 per cent of their floor space for manufacturing. This holds good particularly in the case of about eight concerns, most of whom are the sole occupants of their respective buildings. However, the tendency is growing to devote more and more of the available space to selling and to locate the manufacturing department away from the selling department, retaining only enough help in the building to do the necessary fittings or alterations.

If the existing loft buildings above 27th street and east of Sixth avenue were not to be used in the future for manufacturing there is no reason why these buildings could not be used for salesrooms, for wholesale jobbing houses or as manufacturers' sample rooms. Quite a number of them could be altered at relatively small expense into office or mercantile buildings.

Statement by Robert S. Binkerd, Secretary of The City Club of New York, March 28, 1916

Importance of districting

It is hardly necessary for me to appear before you to say that the work of your Commission has the hearty support of the City Club. You know that in every step we have given all the assistance in our power. The successful accomplishment of your work is not only by far the biggest thing before the City of New York, but it is the most momentous step in city planning undertaken in this country. It is something toward which the minds of intelligent and far-seeing men throughout the country are already directed.

Protection of small parks

What I have to say deals with a few of the large questions. With regard to details we will file a brief.

We have already stated that your preliminary plans in our judgment do not sufficiently protect the surroundings of the small parks of the City so as to make them the sustaining hearts and, in the future, the real neighborhood centers of residential districts. In your present proposal you have made great progress in remedying this situation. This progress, however, still seems insufficient, as it is very important that the streets which are immediately behind these small neighborhood parks shall also be restricted to residential purposes. If residential streets have a park in front of them and business and manufacturing pressing immediately behind them, their situation will be exceedingly precarious.

We appreciate that there will be small parks in which you will not be able to follow out our recommendations. The discovery of these parks will be a matter of considerable moment. Wherever you cannot protect a small park as the heart of a residence district, there is a prima facie case that a park has been located where one ought not to be. This knowledge will be of great usefulness to the city authorities, not only in the question of any possible sales of such parks, but also in the location of new parks.

As rapidly as we can, we are making a survey of all the small parks of the city, which will be filed with you for your assistance.

Business on first floor of residential buildings

We think you would be able to accord fuller protection to the surroundings of the small parks if you would establish a fourth classification, which would recognize the wide-spread combination which consists of a store upon the ground floor and of apartments and living quarters above. We earnestly urge the creation of this fourth classification.

Protection of the suburbs

There is a natural tendency to look upon the outskirts of a city as something which is going to more or less take care of itself. Generally not much attention is given to the restrictions imposed upon this part of a city.

A reading of Mr. Graham Taylor's account of the "Satellite Cities" is very illuminating on this point. There are great centrifugal forces working in our large cities to-day which are throwing a larger and larger amount of manufacturing out toward the city's perimeter. Every betterment of transportation facilities apparently accelerates this movement. A very considerable number of the workers of this city are going to work and be housed in the future on the outskirts of the city. We earnestly urge you to bear this in mind, and to give to the provisions for the outlying districts the same degree of care and attention which are given to those nearer the heart of the city.

Statement by Dr. Gustave F. Boehme, Jr., Neurologist, Clinic Assistant, Manhattan State Hospital for the Insane, May 24, 1916

Nervous effect of high buildings

I have looked at the deleterious influence of high buildings from two aspects, one from the attitude of the persons living in the high buildings, and, second, from the attitude of the persons living outside of the high buildings in neighboring structures.

Persons within high buildings, and particularly those in the upper stories, if they tend to be heart patients, or tend to be persons given to certain fears, or neurasthenic individuals, are prone to suffer from the altitude of high buildings. There are certain types of nervous patients, for instance, who cannot stand working at heights. If they are employed in buildings, say 15 or 16 stories in height, the effect on such persons is that they are going to be more or less afflicted with a wrecked nervous system which will unfit them for other work. Another element that enters into it is the question of the elevator. While I was studying this problem I took the blood pressure of a number of people before ascending the elevator, and at the top of the elevator I took their pulse rates. I was surprised to find out that there was a marked increase in the pulse rate, and that their blood pressure had risen.

Now, dealing with the heart patients, those who have heart trouble, for instance, that sudden transition in the change of the blood pressure and in the pulse rate would be very injurious. Besides, if a person who is suffering from neurasthenia, or a hysterical girl is employed on the twentieth story of a high building, the constant trip, for instance, of twenty flights, the elevator shock with a change of pulse rate and everything else would be harmful to her, and in a great many instances, some of the nervous disorders that girls in the upper stories are afflicted with, can be attributed to the elevator trip. Then, of course, there comes the question of people who necessarily cannot live in high buildings owing to respiratory difficulties. That is also to be regarded.

The rise of 150 feet in a 12-story apartment house would certainly affect the individual living there. In fact, in Forsheimer's statement attention was called to the fact that neurasthenics ought not to be taken to high altitudes unless they are very careful and under the study of physicians.

We figure that the people in office buildings are all of a neurasthenic variety. The effect of the altitude on such people aggravates their condition. It is very hard to give any definite statement as to the number injuriously affected. In later years there has been a marked increase in nervous disorders and troubles.

There is a type of patient who cannot stand height, and if they are

all of that type you can do them a tremendous amount of damage even toward suicidal impulse from high windows.

Court apartments unhealthy

The lack of natural light in rear apartments has a bad effect on the health of tenants. First of all, I find a great many women suffering from anemia due to the fact that the apartment is not properly aerated by sunlit air. Then, because of the congestion, the noise, and the fact that the purifying influences on the air of the court is not present, we find many who suffer from marked nervous conditions. In any of the side street apartments where there are no facilities for natural light, practically every inhabitant is below par as an individual unless he takes care of himself, goes out and plays golf or tennis, and so gets away from the bad influences due to non-sunlit air.

Importance of sunlight.

Air that is not aerated by sun light is absolutely injurious to health. If you place a tubercular patient in a room lit by artificial light—gas light—as in a typical apartment in New York City, and let no sunlit air come through, you can obtain specimens of tubercular bacilli for a long time afterward, but if the apartment is open to sunlit air two weeks afterwards you will find a perfectly sterile atmosphere, insofar as tuberculosis is concerned. The tubercular bacilli is destroyed. Of course, it is manifestly impossible to get sun light during the whole day. At most it is perhaps only possible to get it for an hour or two during the day. The sun light shining on the floor during those one or two hours each day would be sufficient to accomplish that purpose, but it would take a little longer time than if more sun light was available. In Switzerland they put patients perfectly nude where the sun light can play on them, and they brown up and become perfectly tanned, and these patients clear up more rapidly than people who don't undergo such treatment. In other words, air combined with sun light becomes very beneficial. They leave them lying there without a stitch of clothing on for a long time.

Any law or ordinance which will restrict multiple dwellings within the City of New York yet to be built to five or six stories, will be a positive benefit to the city from the viewpoint of health.

If the unoccupied area of yards and courts be made more extensive than at present, giving more light and air to those who dwell in multiple dwellings, I would look upon that, too, as a distinct advantage to health.

I would go so far as to say that there is urgent necessity, in view of the present rapid extension of nervous disorders in New York City, for a change in the laws which will bring about lower buildings and wider and more extensive unoccupied areas.

Aside from the healthful effect of sunlit air there is a peculiar value from the standpoint of preventing nervous troubles or disorders, in giving a man having a chance to work in a garden, to take care of a lawn, or to take care of trees and shrubs. In fact, we frequently are forced to have city dwellers cease living in the city and send them to such places to give them an opportunity to get next to nature. You assist them in this way. We live in congested houses with all kinds of noises about us. We live with the tension of having our neighbors continually spying upon us. Now, take a man living under such conditions, and place him—if he is of a nervous type—in a house and garden of his own. The restraint is lost, and

he feels himself as a separate individual, allowed to work out his own salvation in his own space.

I go occasionally into the private home section of the Bronx, and I noticed there a short while ago that the people are usually feeling better than people living in congested districts. They seem to be able to go to work fresher in the morning, purely because of the fact that they have plenty of room and the section is not built up solidly.

Car-sickness

From a health standpoint, there is a very marked and particularly harmful effect in the daily travel back and forth on the subway. I have a patient who lives in Brooklyn—she comes to me all the way from Brooklyn. She happens to be a stenographer downtown and travels back and forth on the subway. The effect on her nervous system is such that every time she comes to my office she vomits. There are certain other types of patients who have car-sickness. They suffer from traveling on the cars in the city. There are other people who suffer from the noise in the subway. I have patients who simply cannot travel back and forth in the subway on account of the noise. Then also comes the proposition of the irritable individual due to the jostling and constant noise. I happen to have a patient of a neurasthenic type, for instance, who lives in the Washington Heights district. I order such patients to come down on the elevated railroad or by the bus in preference to the subway.

I would look upon any plan for the distribution of population during home hours and working hours, and which will cut down the time that people spend in the subway, as a positive health advantage to the City of New York.

Noise as a cause of nervous disorder

I feel that if it were possible for those who suffer from nervous diseases, to live on a quiet residential street, it would practically amount to living in a little house in the country, and take away a great many of the things that produce the symptoms of nervous disorder. If they could live there they would be away from those things.

In building a sanitorium in New York, you must look around for just such a street. I recall specifically an instance of this kind, Lloyd's Sanitarium, 155th Street and St. Nicholas Place. At the time the Manhattan subway was under construction a great big hammering plant was in use in front of the sanitarium. Some patients treated in that building almost went into spasms with that plant pounding away from eight o'clock in the morning until six at night.

Statement by J. H. Burton, Chairman, Save New York Committee, March 28, 1916

Elimination of factories from Fifth avenue

The plan of the Zoning Commission is of vital importance to the City of New York as it affects its very existence and future welfare.

I represent the movement which has received the name of the Save New York Movement, which has for its object the elimination of factories in the localities north of 32d Street. We heartily endorse the plan of this commission.

When this Save New York Movement started, the basic idea was to keep the factories from destroying the vast wealth in real estate, in business

and in homes, north of 32d Street, without benefiting anyone. But since this movement has assumed its present proportions, speaking for the Committee who started it, we consider that success not only means a great deal for the section of New York above 32d Street, but a great deal more for all the rest of New York as far down as Worth Street. It will tend to bring back the deserted section. It will add to the values of the tenement houses in the lower part of this city. It will improve conditions in Greene Street, of which the statement has been made that from Canal Street north there is hardly a single building that has not a "for sale" or "to let" sign on it, with the exception of the United States Post Office.

It will mean more in ultimately increasing the assessed value of New York real estate, and therefore in reducing future taxes than any other plan; and further, it will mean a great deal to the cloak and suit manufacturers and those kindred manufacturing interests, because it will tend to reduce their overhead charges, as they can secure space for manufacturing purposes downtown at 30 or 40 cents per square foot, as against 80 to 90 cents uptown, and it will mean a great advantage to the working men if the factories they work in are in sections near their homes so they do not have to spend an hour every day in subways and also spend money in car fares.

We believe that in the end the plans of your Zoning Commission will mean more to the City of New York than any civic movement that has ever been undertaken, and that what our "Save New York Committee" is appealing for applies to the heart of the city, and, unless you help the heart of the city you cannot help the rest.

I wish to repeat that when this "Save New York Movement" started a few months ago we had in mind only the preservation of the section north of 32d Street, but we realize now that our obligation is towards every part of the city, and the preservation of this section accomplishes that object.

I have received, as the chairman of this committee, three hundred letters a day from every part of New York, from people on the Bowery, on Washington Square, and people who have had no interest whatever in the future of the city, and they seem to think that this movement is going to mean a great deal for this city in the future—a great deal more than anything that has ever been undertaken.

Prominent business men through the West have written to us and said that it was of the utmost importance, and that they take just as much pride in New York City as anyone that lives here. We feel it would be dangerous to allow factories to come in and destroy the heart of New York. We wish to endorse, in every way, the plan of the Zoning Commission.

Statement by Hon. William M. Calder, April 11, 1916

Residential values depreciated by invasion of laundry

Mr. Calder stated that the erection of the Pilgrim Laundry at Prospect and 11th Avenues had done more than any other thing in that part of Brooklyn to depreciate the value of residential property. This laundry, he thought, had in that section reduced the taxable value of real estate by 50 per cent.

Statement by Mills E. Case, Secretary, Police Department, July 24, 1916

High buildings congest streets

I would respectfully report that after careful study of the data at hand I am convinced that high buildings are important factors in causing street accidents and that the presence of business houses and factories in a residential district increases the probability of street accidents.

Street accidents increase with congestion

There are so many factors tending to cause accidents that it is a matter of some difficulty to state fairly how much or how little any one factor should be blamed. I have not had as much time as I should like for the study of this interesting problem in its details, nevertheless I believe that the main points are well established and trust that the following considerations will make this clear.

I have selected ten precincts in Manhattan which fall into three groups:

I—Precincts with factories and business with a large population: 35th, 39th, 43d, *i. e.*, the Upper East Side above 79th Street, population 416,000.

II—Precincts with very considerable business and a large population: 7th, 13th, 15th and 17th, *i. e.*, the Lower East Side from Manhattan Bridge to 14th Street, population 458,000.

III—Residential districts with a small amount of business: 36th, 40th and 42d, *i. e.*, the West Side above Cathedral Parkway (110th Street), population 213,000.

In the first group the number of accidents per 1,000 of population during the first half of 1916 was 1.70; in the second group, 2.21; in the third group 1.43. The population in thousands per mile of street in these groups is approximately 7, 10 and 12, respectively. From this it appears that accidents per 1,000 inhabitants increases rapidly as congestion (population per mile of street) increases; hence, increase of height of buildings increases accidents.

Mixed occupancy increases street accidents

The question of mixed use is complicated with that of congestion, but a study of the individual precincts in the following table will help to disentangle it:

Precinct	Miles of Street	Population (000 Omitted)	Population Per Mile of Street	Accidents, First Half 1916	Accidents, Per M Population
35.....	14.5	127	8,760	163	1.28
39.....	23.	192	8,350	363	1.89
43.....	17.	97	5,700	182	1.88
	54.5	416	7,140	708	1.70
7.....	11.33	72	6,340	128	1.78
13.....	10.	112	1,200	325	2.90
15.....	15.	155	10,300	372	2.40
17.....	11.28	119	10,600	187	1.57
	47.61	458	9,820	1,012	2.21
36.....	25.	87	3,480	142	1.63
40.....	30.	66	2,200	76	1.15
42.....	51.28	60	1,170	86	1.43
	106.28	213	2,010	304	1.43

The 35th precinct lies between 79th Street and 96th Street and is distinguished from the other two precincts in Group I by the existence of high class residences in its western half. This reduces its accident rate from 1.88 or 1.89 to 1.28.

The 17th precinct has proportionately less business than the 15th precinct, though it has a greater density; this reduces its accident rate from 2.40 to 1.57. The 7th precinct is similar.

It may be objected that the 36th precinct with a density of only 3½ thousand per mile has an accident rate of 1.63, as against 1.57 in the 17th. The explanation lies largely in the fact that the streets run at dangerous angles and that there is considerable business on Broadway, Amsterdam Avenue and Manhattan Street.

Now compare the 43d precinct and its factories with the 7th, which is slightly denser, and note that the accident rate is 1.88, as against 1.78. This, I think, measures the effect of factories.

Statement of Ernest K. Coulter, Superintendent, New York Society for the Prevention of Cruelty to Children, May 24, 1916

Juvenile delinquency

Congestion of population is a large contributing cause to juvenile delinquency. Some years ago, while in the Children's Court, I made an extensive study of the matter. As a result of that investigation, I would say that at least 40 per cent. of the charges of juvenile delinquency result from the thwarted desire of children to play. This desire in a child is God-given. But in the denser districts the opportunity to play properly and normally is denied these children. The result is that often they give vent to their pent-up energies by doing things which infringe on the rights of others. The bigger the crowd the less the rights of the individual. To play ball, cat, or shinny in the street is against the law, and yet any one of these games is wholesome for a child under proper conditions. Being denied the opportunity to play wholesome games, the suggestion is made to the boy in the crowded districts that it is great fun to steal something from a pushcart. He goes into it chiefly to gratify his desire for adventure and activity. There is the excitement of the chase and that means more to him than the value of the trifling piece of property he has taken. In time that boy is led to more serious stealing and perhaps becomes a pickpocket.

It is in those districts where the greatest congestion of population exists that the more serious delinquencies are found. Crime, delinquency and disease thrive in the dark. Where there is serious congestion, darkness and bad living conditions exist. Of course, not all delinquency nor cruelty to children is confined to the congested districts.

Exclusion of stores from residential streets

Something has been said about exclusion of stores from residential streets. I believe that if stores could be kept out of tenement houses, conditions would be improved. Dr. Price has testified regarding herding people in the back rooms of these stores. That is a serious thing. The families of the proprietors and often boarders are crowded into rooms that have little light or air. Physical and moral conditions in such surroundings cannot but be bad. Then there is another factor—the obstruction of the street space that the children and residents need. The sidewalks are cluttered up,

pedestrians are often forced into the roadways, litter is thrown about and conditions are generally bad.

I look upon any plan that will result in a greater distribution of population as most desirable. To attempt any radical reconstruction of buildings that now exist, would, perhaps not be feasible, but I feel strongly that measures should now be taken by the city to prevent further growth of the congestion which now exists on Manhattan Island and some places in the Bronx.

Some years ago it was found that there were more than forty blocks on Manhattan Island where the density of population was greater than 1,200 to the acre. In places it ran as high as 1,600 to the acre. I do not mean to say that all of the 40 blocks were together, but most of them were on a narrow area of the island. The congestion in the Bronx is becoming quite serious.

Tenement cellars as living places

As to the use of tenement cellars as living places, according to figures which I obtained some years ago, there were 25,000 tenement cellars used in Greater New York for tenant purposes. I remember where twenty persons lived in one cellar. Of the 25,000 tenant cellars used for living purposes, a little less than 15,000 were on Manhattan Island alone.

If we are to take any thought for the future of this city, we must do something now to bring about a more reasonable and wholesome distribution of population.

Statement by John B. Creighton, President, Fiske Terrace Association, Brooklyn, April 17, 1916

Preservation of private house districts

As representing the Fiske Terrace Association I can say that no association in the whole City of New York has followed with greater interest the movement for the restrictions which you have before you. Our organization is assessed for two and a half million dollars. We pay $50,000 a year to the city treasury. We have one hundred and sixty-five families in that association. We are bounded on the east by Ocean Avenue, on the west by the Brighton Beach Railroad, on the north by Avenue G and on the south by the Long Island Railroad, a very compact and well-organized community. We are spending $1,500 a year in paving streets and keeping up the parks and lawns.

Fiske Terrace is one of the beauty spots of Flatbush and we are very much interested in these districting regulations and we have actively supported them ever since they have been discussed in our meetings. We wish to commend as an association, the efforts of your Commission as second in importance only to the dual subway contracts. As the dual subway contracts represented the first scientific and broad constructive work in laying out a rapid transit system, so districting is a broad and scientific effort to conserve the city and to lay it out as a great and growing city should be laid out.

We have canvassed one hundred and sixty-five families and we have got ninety-five per cent. of them to sign for an unlimited restriction. Our restrictions ran out in 1915 and immediately two apartment houses were erected on Ocean Avenue which we regard as rather spoiling Ocean Avenue. We feel that Ocean Avenue is destined to be an apartment house street and probably never can be saved from apartment houses, but that it eventually will be like Lenox Avenue in New York, one solid mass of apartment houses from Prospect Park to Sheepshead Bay.

We want you to classify in the "E" section everything inside of the Ocean Avenue frontage. We have there to-day exactly what you planned to place in an "E" section everywhere else. The fact that there is a possibility of apartment houses being erected on these interior plots has had a tendency to cheapen values. A house that was bought originally when the Ackerson development was made for $16,000, was sold last week for $12,000 because the parties in interest were afraid that an apartment house would be built on a vacant lot next to it. This is a criterion of values dropping from a fear of apartment houses going in there. Now you will conserve the values to the extent of $4,000 per house by restricting, and you will also actually relieve the taxpayers from the greater fear of what might come to them. I think that is in brief the story of Fiske Terrace. We can show you a map with ninety per cent. of the property owners asking for unlimited restrictions there.

Statement by Edmund Dwight, Resident Manager, The Employers' Liability Assurance Corporation of London, May 18, 1916

Districting will reduce number of accidents

I heartily approve of the program of the Commission. From the standpoint of accident prevention and accident reduction, any legislation which will reduce congestion is of the utmost importance.

I have been for thirty years the New York Resident Manager of the Company that began the business in the United States, of insuring against liability arising out of personal accidents, and during that period there have been reported to my office more than 200,000 accidents, the majority of which have occurred in New York City. These have included accidents to the public caused by the use of elevators, and in the streets from vehicles, as well as from many other causes in buildings and in streets.

My experience has indicated that accidents increase as congestion increases, and any plan which will reduce congestion of population in buildings or in areas of the city will reduce the number of accidents.

The proposed limitation of heights of buildings will reduce congestion in elevators, which is one of the prolific causes of elevator accidents.

Elevator accidents are due in far larger proportion to crowding, to carelessness on the part of passengers, and to unskillful handling which is itself frequently caused by crowded cars, than to defects in mechanical appliances.

The number of street accidents also in large measure follow increase in density of population, and it is strikingly the case that the proximity of manufacturing operations to crowded residential districts constitutes a peril, because heavy trucking express and similar traffic has to be conducted through streets which are crowded with children.

There is no question in my mind that limitation of building heights and districting for different classes of use, so that manufacturing operations would be carried on in zones with a minimum residential use, would each tend, in large measure, to the reduction of accidents, and to the safety of the people of New York.

As an owner of property in various parts of New York, I am satisfied that while in individual cases there might be some hardship, resulting from the proposed system, it should work as a whole to the enhancement and stability of real estate values, and to the great welfare of the community.

The plan of this commission provides for certain residential streets

from which trade and industry will be excluded. This, in my judgment, will undoubtedly tend to reduce the frequency of street accidents. Manufacturing operations carried on extensively in sections of the city which are also used for residential purposes and which involve an extensive use by truck, vans and express wagons, in residential streets, increases the number of accidents in the street. I believe that the same would be true if the mercantile use of the streets could be eliminated or reduced in residential sections.

No general statement can be made as to the time necessary to take tenants out of high buildings by means of the elevators, because the conditions in each of the buildings vary. There are, undoubtedly, some buildings of more than twenty stories in height in which it would require considerably more than half an hour to take the occupants out by means of the elevators There are others, in which this could probably be accomplished in approximately a quarter of an hour. The higher the building, the longer the time necessary, in proportion to the number of floors.

As a very rough test, I think that upon the average, it might be stated that an office building was well equipped which could discharge its occupants by means of the elevators, at the rate of a minute a floor. In a loft building, the time required to clear the building of occupants by means of the elevators is greater than in an office building of the same size, because the elevator equipment is less complete in proportion to the number of persons occupying the building.

The fact that elevators used by the employees in loft buildings are also used for freight purposes, makes the danger from panic more serious in the case of loft buildings, than in the case of office buildings. Freight elevators, or combined freight and passenger elevators, cannot be made as satisfactory for the quick movement of passengers as elevators used solely for passengers.

Statement by Abram I. Elkus, United States Ambassador to Turkey, May 24, 1916

Work of the State Factory Commission

I was counsel for the State Factory Commission. The work of this Commission, which occupied between three and four years, covered factory conditions in cities of the first and second class, and in some other parts of the State and also industrial conditions in mercantile businesses, and then there was an investigation into wage earning conditions, upon which a report was made to the Legislature with reference to a minimum wage commission. The results of our investigations were published in a report of thirteen volumes.

Districting a great benefit to city

Knowing conditions as I do, particularly in the factory and working districts of the City of New York, I would say that the plans proposed by the Commission are an urgent necessity at the present time from the standpoint of health, safety, convenience, comfort and general welfare. It would be a very great benefit to the whole community to have it districted, not only to those who do the work, but to the general citizenship.

I look upon most of these things as having an economic value besides merely a health benefit to the persons directly involved, for the reason that it has been proved over and over again, if you adopt measures which make for the safety of life and the preservation of the health of the people, you

lessen the number who are likely to become public or private charges, and that redounds to the benefit of the taxpayers. It is so all along, and was illustrated before the Factory Commission by a number of men. For instance, I remember very well in one of the cities up in the State that a gentleman came before us and said that he had already installed various improvements in advance of what we were going to compel factory owners to do, not from motives of philanthropy or because it was a good thing he said, but because he thought it was the best thing to do since it would pay him to do it. And he said it is purely a matter of dollars and cents. I can get more work out of the employees and better work! I have not the slightest doubt that I will save my own city in taxes by preventing these people from becoming sick or ill and being public charges. That has been proved to be true in a great many instances.

I have not the slightest doubt that with these districting regulations you are going to furnish people with not only a better place to work in, and better situated buildings to work in, but improved conditions surrounding their work. You will find that they will do better work, and do more work and a higher class of work, and that you won't find so much sickness. In other words, it is the old case of prevention, that is better than cure. Of course, it is going to hurt in the transition. That is the great danger to be avoided, by making the transition as easy as possible. If we could rebuild the City of New York, I presume the ideal thing to do would be to put the factories all along the waterfront, where you have transportation right at the door, and then put the dwellings for the workers on a line inside next to the factories so that the employees can walk to their work, and then put the retail shops in the center of the city. I don't suppose you can do that. I take it that this Commission is going to do the next best thing, and restrict the future use of the streets so that they will be of the utmost benefit to the great majority of the people.

Co-ordination needed in building regulations

Many of the advantages of the factory law are lost by reason of the fact that its scope is limited to the particular building in which the factory or workshop is located, and not to the locality of the factory. Many of the advantages, for instance, of having large windows, well ventilated rooms, are lost by persons who are next door to the skyscraper buildings which shut off their light. The same may be said of the Tenement House Law. It does not regulate any structures but tenements and therefore it does not control other buildings which are erected adjacent to tenement houses. Any measure that brings about a co-ordination in these laws or in the buildings covered by these laws, distributing them in districts, where buildings of certain types may be located, would be a distinct benefit to the city from the standpoint of health and safety.

As a matter of fact the modern high building is much better built than the old buildings. Of course, I am not a physician. I do not pretend to say anything about the results to people working in high buildings, but as a matter of fact the modern loft building, which is usually for factory purposes, and which is more than six or seven stories in height, is built much better as far as safety in case of fire, and sanitary conditions are concerned, than the old law buildings.

Old buildings converted to new uses

The worst factory buildings were found to be those which were converted tenements or warehouses. They are patched up in order to try to

comply with the law. They had no light, no guard against fire, no extra means of exit, and the sanitary conditions were very poor.

We ought to try to make permanent certain localities in the city to be used for certain purposes and that would permit of buildings being erected adapted for such purposes, or altered for such purposes permanently, instead of requiring changes to be made periodically, and instead of permitting the old buildings to be changed and changed rapidly. It does seem to me at times that it is a very great hardship if a man erects a building and complies with the then existing law and does everything he can do to make it comply with the law, to then have the Legislature come along, for very good reason I will say, and decree that he should change it or alter it at great expense to himself and with no apparent benefit, and then, of course, to have another man come along and construct a building complying with the new law right next to him, which is far superior to his—sometimes I feel really that the State ought to compensate the man for his building.

Greater safety in low buildings

Any plan that proposes to reduce to six and seven stories in height the kind of buildings that formerly were permitted to go as high as twenty-one stories, would be a positive benefit from the standpoint of safety. Our whole Factory Law shows that. We increase the safety guard as the buildings become higher. They must be of a certain kind of construction above a certain height. They have to have a sprinkler system above a certain story. They must have all sorts of restrictions and means of escape as the buildings become higher and house more people. But, if you could cut off the buildings and make them all lower you would certainly conduce to safety. There is no question about that. Now, take present conditions in the old buildings. Personally I say I would rather be in a twelve-story or a twenty-story modern fireproof building that has a sprinkler system and all of the modern conditions for safety, than I would in a five or six story building that was not under the same conditions.

Manufacturing in tenements

All manufacturing, to my mind, ought to be taken out of homes, for economical reasons, as well as for health reasons. We have made a very thorough investigation of manufacturing in tenements, and the results showed very bad conditions, not only to health, but as I have already said, for economical reasons which ought to be established. They are due to the extension of the factory to the home without any of the requirements which cover factory work being extended to it. In other words, if a man employs people in his factory he must have a certain number of safeguards and give his employees a certain amount of air space. He must have all sanitary arrangements. He has to do a great many things for their safety and for their care—perhaps not enough—nevertheless he has to do a great many things; but, in the home that same man can send the very same article to be manufactured, and none of these conditions that I have mentioned have to be complied with. Manufacturing is done in the living rooms of tenements with all the family present, because labor conditions do not have to be observed there. You can't do anything in that matter just now. I don't think you can be too strong about this home work proposition.

Statement by Dr. Haven Emerson, Commissioner, Department of Health, City of New York, February 10, 1916

Regulation of cornices

Not only do cornices, as used in the past in New York City, generally detract from the simplicity, beauty and architectural attractiveness of the buildings and the streets, but by their overhanging they deprive the passing citizen and the neighboring and opposite dwellers or occupants of light and heat from the sun, to which they are entitled and which are of value to the health of the community.

Further, it is a matter of common observation that the dripping of rain water and melted snow and ice inconvenience the foot passengers and maintain the kind of nuisance from wet pavements which is forbidden from other kinds of projections, such as hanging flower boxes, food safes, etc. Actual bodily danger is suffered as the result of icicles hanging in some cases over one-third of the width of the sidewalk.

In permitting cornices on the set-back walls to have a greater width of projection than those on the street wall, I trust some provision can be inserted which will prevent such cornices from encroaching on the line established by projecting the line from mid street to top of street wall upward and backward.

Statement by Dr. Haven Emerson, Commissioner, Department of Health, May 4, 1916

Sanitary conditions of office buildings

Dr. Emerson stated that the Health Department had made a survey of the health conditions of the persons employed in the office buildings within the block bounded by Broadway, Nassau Street, Liberty Street and Cedar Street. This block is immediately north of the Equitable Building, which has a height of 36 stories. This is a representative business block in the downtown section, containing buildings of both the older and more modern types.

The air used in these buildings, which is generally supplied through an artificial system of ventilation, is generally far below normal in its humidity and above normal in its temperature. Artificial light is used practically every hour in the day and every day in the year by 85 per cent. of the occupants of these offices. A census showed this block to be inhabited by an office population of 2,400 persons. The number of persons visiting this block each day to transact business is about 16,000. The total number of persons accommodated in this block daily is therefore 18,400. The absence of natural light, and the abnormal conditions of the temperature and humidity in office buildings constitute, according to Dr. Emerson, a situation that is detrimental to health, not that it causes disease, but that it promotes lack of resistance and lack of proper physical and mental vigor.

Tuberculosis in old law and new law tenements

An investigation made by the Health Department of the patients suffering from tuberculosis in the twenty-fifth census district, which is bounded by Broadway, East Houston Street, West Broadway, Waverly Place, Sixth Avenue, 14th Street and the Hudson River, clearly demonstrated that, not only are there fewer cures among those living in old law than in new law tenements, but the ratio of secondary to primary cases is higher

in the old law than in the new law tenements. Secondary cases are those which have been acquired through contact with primary cases. In the new law tenements the incidence of secondary cases is decidedly lower than in the old law tenements.

About 45 per cent of the tuberculosis patients in this district shared the same room and the same bed with other people. This intimate personal contact, of course, encourages the spread of the disease. Of the rooms occupied by patients with tuberculosis 6 per cent were absolutely dark; 16 per cent dimly lighted; and 78 per cent lighted by windows in such a manner that artificial light was not required all the time.

Necessity for districting

Adequate and effective standards of light and air in the interest of public health, in Dr. Emerson's opinion, can be obtained only through a comprehensive districting plan.

I would say, that the opinions of physicians have been expressed in reports which are almost identically worded, dating back at least one hundred years, with exactly the same conclusions and recommendations which might be considered parallel with those now arrived at by this Commission; also that the report of 1832 and previous one of citizens committees on conditions of health in this city indicated the necessity of providing for the future. These recommendations were made when the development of New York City had not yet reached 14th Street. We are still without the necessary relief, which nothing but this plan of yours can provide. These health conditions have not improved and the demands for reform have not yet been met. There is no control at the present which would prevent the re-creation of exactly the same unsanitary conditions that have resulted from previous lack of control.

One of the difficult things, aside from the present sanitary inconvenience and danger, is the condition that was met with in providing space for offensive trades, such as chicken slaughter houses. The device that was used by the Department of Health to protect adjacent owners and still give the property owners the right to select their own neighbors has never met with entire public approval. A great many of the advantages created through sanitary and housing reform have been lost by reason of the fact that these various laws, which were an improvement over what went before, were not co-ordinated with one another.

Street cars and communicable diseases

Another point in which health authorities foresee benefit to public health by a consistent plan for the control of the future growth of the city is in the improved conditions of occupancy of traffic conveyances. It is appreciated and acknowledged that the more congested is a traffic conveyance the more dangerous does it become as a means of transmitting communicable disease to others, and there is a constant proportionate increase in infectious organisms found in the air of traffic conveyances as their congestion increases.

Observations made in the subway from the Atlantic Avenue station to 96th Street and back through the subway during the rush hours has shown a constant increase of disease breeding organisms, such as were responsible for the epidemic of infectious colds during last December, January and February.

Observations show the presence of these bacteria in such amounts as to constitute a serious public menace. The epidemic cost the city two thousand

lives, over and above the usual death rate, as it prevailed a year ago and for the previous five years. Those deaths were due to organisms which were found constantly in the air of the subway cars, as it was examined in our laboratory.

That epidemic extended over a period of from eight to ten weeks, during which time it prevailed in our large centers of population in this country, and it occurred at the time of the maximum crowding of stores and places of amusement and traffic conveyances and at a period of maximum of fatigue and exposure, owing to weather conditions and the holiday trade, and it is at such times that we may expect an annual wave of increased respiratory disease. We may expect a repetition of it annually in a greater or less degree as the period of the year comes around when the windows are shut because of the lowering of the temperature, and respiratory diseases begin and steadily increase. There are two large episodes in the death rate, one infant mortality—deaths in July and August, and the other the increase in respiratory diseases during the cold months of the year, and that is ascribed by sanitarians to the crowding of people within confined spaces so inadequately provided with means of ventilation that personal resistance becomes too low to avoid infection.

To indicate the extent to which the Board of Health has considered public danger through the crowding of cars, I would call your attention to orders which were issued to forbid the crowding of cars on certain lines in the city where traffic conditions would permit of such control being put in force. The most noticeable instances were the cross-town lines in Manhattan, at 86th Street and 59th Street, where the companies admitted that service could be provided sufficient to avoid the crowding of cars to over 50 per cent of their seating capacity, and on Staten Island a similar condition prevailed. When it was called to the attention of the street railways companies that infection of humans occurred as the result of persons crowding in conveyances, they accepted the orders of the Board and complied. This aroused opposition on the part of people whose real estate development was predicated upon permission to carry the crowds regardless of congestion The Board of Health has thought that the time has come when such crowding should be forbidden, not as a matter of personal convenience, but as a matter of community danger—community health hazard.

Importance of sunlight

The causes that take off a large percentage of the lives in a great city, particularly New York City, could be summed up in the words, opportunity for personal contact and diminished personal resistance. Congestion is a term that can be twisted variously. Diminished resistance of humans, as with vegetation, depends upon the artificiality of their environment. You cannot raise babies any more without light and air than you can raise plants, and where you cannot prove that a disease has followed congestion you can almost always show diminished resistance.

We should expect less communicable respiratory disease in detached houses than in tenements, but inasmuch as the reporting of respiratory disease is not compulsory, there is no record anywhere in this country of the incidence of respiratory diseases other than tuberculosis. We have no morbidity statistics of the City as a whole and there are no comparative figures to prove it.

It is proved that sunlight in the living room and the sleeping room

materially aids in providing resistance against diseases like tuberculosis. The sun has a destructive effect upon disease breeding bacteria. Direct sunlight is a most effective disinfectant. Direct daylight—even though not direct sunlight has a powerful influence in destroying pathogenic bacteria. In addition to that people who are able to live in well lighted apartments have a physical resistance which is superior to that of people who live in dark rooms. That has been proved under exact experimentatal conditions in laboratory tests and is a matter of common observation among human beings.

The morbidity of tuberculosis in the old law tenements is twenty per thousand of population, and in the new law tenements it is fifteen per thousand of population. The morbiditity of tuberculosis in the twenty-fifth census district is ten per thousand, and for the entire city one-tenth per thousand.

It is the popular impression that all artificial light is detrimental to the nervous system and causes a deterioration of nervous control; but the damage to people's individual resistance is probably a more important factor than the actual damage to special senses, except where the light is obviously insufficient or excessive.

As much damage has been caused by an excessive supply of light in certain places as has been by the absence of sufficient light in other places. One can stand a superfluity of sunlight and benefit from it. In a room where there is the same amount of light supplied by an artificial means, very serious nervous disabilities result, owing to the entirely different physical qualities of most artificial light.

Effect of vegetation on humidity and temperature

Continuous high temperature of a hot spell in the city is higher and more prolonged in areas where stone or brick or concrete construction is continuous, than where there are open spaces. Radiation during the night does not permit of the same reduction of temperature in densely built-up areas as occurs in other parts of the city where those conditions do not exist. Our general experience is that most of the heat prostrations occur in districts where there are few or no open spaces.

Humidity is maintained more nearly the normal point in the vicinity of open spaces where there is a vegetation. Other things being equal, the temperature tends to be lower in the neighborhood of parks.

Relation of stair climbing to health

Excessive stair climbing and excessive standing when fatigued in crowded conveyances unduly aggravate certain disabilities from which women suffer. Climbing stairs is not *per se* any more dangerous for women than for men, but the disabilities from which they commonly suffer are apt to be aggravated more than the disabilities from which men suffer. The class of people who suffer much more than women is the large army of children with cardiac diseases, and there are 16,000 children in the public schools of this city who have now such damage to their hearts as will probably permanently handicap them.

At least two per cent of the children in the public schools have organic diseases of the heart, resulting either from infection acquired congenitally, or acquired as the result of scarlet fever, tonsilitis, rheumatism, chorea, etc.

These children, if they live in such places as one and two family houses, for instance, or premises where they have but little stair climbing to do, are going to be able to adjust themselves and compensate for their physical

defects during their early years, so as to become fit and effective self-supporting citizens; whereas, if during this period their only possibility of residence is where they have to do much stair climbing, the chances of their permanent injury is considerable.

Dust

Probably the danger of dust is not so much in its carrying the actual germs of disease as in irritating the respiratory passages and making them more accessible to invasion. The amount of dust which people inhale makes the nose and throat more accessible to the invasion of infection when crowded in traffic conveyances immediately after coming from the street, so, with that proviso, I should say this: That where there is excessive dust or excessive draught and spreading of dust through crowds of people in the streets, there is going to be a diminished local resistance of the respiratory tract to such diseases as people are commonly exposed to in crowded premises, such as moving picture theatres, traffic conveyances, and many places of public assembly.

Effect of congestion on health

The infant mortality rate is usually higher in the most congested places, except for certain characteristic racial differences. The congested colored section gives an infinitely higher rate—I should say three or four times, as I recall the infant mortality statistics, than an area similarly congested occupied by Jewish people. There are racial differences involved, so that I cannot make a very broad general statement. The colored infant mortality would be three hundred and the Jewish ninety per 1,000 living births, with similar congestion in similarly constructed buildings.

I should say we could anticipate with perfect certainty a diminished sick rate, a diminished incidence of infectious disease, and a diminished death rate, in all areas of the city limited to residence developments. The portions of the city which have the small family house development show a lower death rate than prevails elsewhere in the city, under equal economic conditions. Children who are brought up in single or two family houses, where there is plenty of land about, are more likely to be healthy than those brought up in an apartment or a tenement house.

STATEMENT BY WILLIAM EMERSON, ARCHITECT, MARCH 28, 1916

I take pleasure in expressing my hearty approval of the purpose and work of the Commission on Building Districts and Restrictions.

This approval is based on the following convictions:

1. That those occupying houses or apartments or carrying on legitimate business will be safeguarded in a continuance of their occupations.
2. That it will result in establishing and standardizing real estate values, thereby insuring fair activity and profits and eliminating excessive profits or losses resulting from sudden changes.
3. That such an assurance enables citizens to devote their time and energies to the fullest development of their business and civic interests without anxiety for the future.
4. That it will give to each citizen a proper share of light and air and prevent the monopolization of these essentials to health and happiness.
5. That the proposed legislation will upset to the least extent established values, keeping in mind the general benefit that will inevitably result from its enactment.

The only anxiety is concerning the surest means to guarantee the permanence of these benefits while at the same time leaving open the necessary field for improvement and development.

Statement by Bruce M. Falconer, Attorney for the Fifth Avenue Association, May 18, 1916

Approval of regulations proposed by the Commission

On June 19, 1913, the Fifth Avenue Association submitted to the Heights of Buildings Commission of New York City, the predecessor of the present Commission, a full statement of its arguments in favor of the limitation of building heights, which was printed in the report of that Commission at pages 211-223.

With the exception of the height rules prescribed for one district, which it regards as too liberal, the Fifth Avenue Association is in hearty accord with the height limitations prescribed by the present Commission, and as to this exception the association has already submitted to the Commission in writing the restriction desired by the association. The recommendations as to area are entirely in accord with the views of the association. The necessity for some such reasonable rules as those prescribed by the Commission and the desirability of providing to some extent for courts and yards appear so obvious and the regulations in this respect have, to our knowledge, been so entirely unopposed as to need no argument here for their support. This statement will be confined, therefore, entirely to the limitation of the use of buildings.

History of the factory invasion of Fifth avenue

Up to twenty years ago Fifth Avenue was exclusively a residential thoroughfare, with the exception of a few retail stores located between 14th and 23d Streets. With the advent of these few retail stores speculative builders conceived the idea of buying a few lots on Fifth Avenue and erected a few office buildings. These buildings were rather flimsily and cheaply constructed. The building laws at that time were not stringent enough to prevent the erection of flimsy buildings. The space in these buildings was quickly rented. The residents in that part of Fifth Avenue began to move further uptown and more speculative builders secured land and proceeded to erect more office buildings.

About 1900 the supply of office buildings had so far outstripped the demand for space that the owners of a number of these buildings found themselves without any income, because of their inability to rent the space in the office buildings. They then looked around and decided that cloak manufacturers would take the vacant space. To this end they proceeded. These manufacturers were told that the Fifth Avenue address, in itself, would be a great asset to their business. They were also told that the nearer they were to the retail trade the better would be their business, and by giving more similar promises the speculative builders induced a few of the cloak manufacturers to move from the neighborhood of Broadway and Spring Street to Fifth Avenue between 15th and 18th Streets. It so happened that the first three or four of the manufacturers who moved into that region *did* increase their business. This was taken for proof that in order to succeed in the manufacturing of cloaks and suits it was necessary to be on Fifth Avenue. Very quickly after this practically 70 per cent of the space in the office buildings on Fifth Avenue below 22d Street was taken by cloak and suit manufacturers.

As time progressed new loft buildings were erected east and west of Fifth Avenue in the side streets and by 1910 the section lying between 14th and 23d Streets was practically given over to cloak and suit manufacturing. Because of street congestion on the part of employees and the consequent absence of shoppers and loss of business and for other reasons outlined below, due to the presence of factories, the retail stores were forced to move. The offices in that district became equally undesirable and cloak-making was really the only industry or business which flourished there at this time. After 1910 the gradual march northward began. The cloak and suit manufacturers crept up to 25th, 26th and 27th Streets and by 1914 their northern limit was 32d Street. During the last two years they have kept on going up and up, until to-day some of them are located as far north as 38th Street. Even above this point and for a half mile or so there have of late become located many wholesale jewelry manufacturers employing hundreds of persons.

Arguments in favor of the limitation of the use of buildings for factory purposes in the Fifth avenue district. Sidewalk and street congestion caused by employees

Between the hours of 11.30 A. M. and 2 P. M. the sidewalks on Fifth Avenue become thoroughly congested with multitudes of employees from the factories in the side streets up to 34th Street. In some places there are merely groups of four, six, eight or twenty men standing on the sidewalk and the roadway debating in strange tongues conditions of labor and other kindred subjects and stopping the free movement of the pedestrians along the sidewalks. At other places, notably between 27th and 33d Streets, the crowds marching four abreast north and four abreast south at a snail's pace are so dense that it is impossible to walk on the sidewalk unless one is prepared to shove and fight one's way through crowds. As many as 1,500 people have been counted on one block congregated on the sidewalks. Almost touching each other front and back they usually move at the rate of about one mile an hour or less up and down in stretches of from four to six blocks, and continually stop to exchange greetings with their friends. The Police Department finds it extremely difficult to keep them moving even at such a slow rate of speed. It becomes utterly impossible for anybody to enter a store or a building, where these crowds block the sidewalks, with any kind of physical comfort, and these conditions are particularly unpleasant for women, who constitute the great majority of shoppers. It naturally follows that customers will not trade in the stores so obstructed. Under such conditions the value of the property for business purposes is slowly but surely reduced and the tenant is forced to move.

In addition to the above described discomfort caused by these crowds it has become customary on the part of the clothing manufacturers to use the streets as an employment office. It is a frequent occurrence that during the hours of the greatest congestion a foreman will run out and ask for a number of workers. In the slack season hundreds of them promptly organize a rush into the building carrying everything and everybody who happens to be on the sidewalk with them into the building.

If it is realized that, according to the census of the State Labor Department, nearly 4,300 people are employed in one particular block in the lower part of the district and that practically all of them are men who come out during the noon hour for fresh air, a smoke and a meeting with their friends, it can vividly be pictured how the sidewalks look. Some photographs furnished by the Fifth Avenue Association to the Commission por-

tray the conditions in such a plain manner as to make further comment superfluous.

Conditions are of course also very bad in the morning and evening at the beginning and end of the working day. In the afternoon especially the sidewalks on the side streets are crowded with tens of thousands of workers scurrying eastward, all leaving work about the same time.

Congestion of vehicular traffic

There is a very close relation between the presence of factories in such a limited area and the presence of traffic congestion. Why this is so is at least in some respects quite obvious. The manufacturer's goods, when finished, must be transported elsewhere in trucks. But this close relationship need not be surmised at or reasoned out. The entire point of Vehicular Congestion is so fully covered in the statement relating to traffic, dated March 30th, submitted by the Fifth Avenue Association to the Commission, as to require no further restatement here.

Congestion in factories

The factories themselves are crowded to the utmost capacity. Rents and overhead charges are high in the Fifth Avenue district, and the manufacturers must use every inch of floor space in order to produce the necessary income. The height of the factories varies from ten to twenty stories; and the number of those employed from 150 to 200 people on a floor. The elevator facilities provided for this large number of employees consist merely of the freight elevators, and, of course, receiving and shipping freight takes precedence over the transportation up and down of the employees. How much time is lost to the individual employee is plainly shown by the fact that at the noon hour the majority find it more convenient and quick to walk down the stairs even as high as from the tenth floor in order to reach the street promptly. Very often one elevator will be out of commission at lunch time, because the elevator boy is out to lunch. Pushing, shoving and actual fighting for a place in the elevator is a daily occurrence in some of the buildings. In the morning the employees dribble in. It takes about three-quarters of an hour for them to come. In the evening, all of them leaving at the same time, every exit facility, elevators and stairs alike, are taxed to the utmost. In spite of this, however, 45 minutes elapse before the tall buildings are emptied.

What a contrast is found in the factories further west, near and beyond 7th and 8th Avenues, where rents are cheaper and the necessity for economy of floor space not so vital! Whereas in the Fifth Avenue factories there are generally only two elevators or less, in the district further west the average number per factory building is four to five. In the Fifth Avenue district there are practically never over two elevators per factory, while only two or three blocks west there are practically never under two.

Reduction in values

When the speculative factory movement began the market value of real estate between 14th and 23d Streets on Fifth Avenue increased and kept on increasing until it struck the high level about 1906. Since that time the decrease has been gradual but constant. The same thing holds good for the side streets. When loft buildings replaced private dwellings used for boarding houses assessed valuations were raised, but afterwards the assessments were slowly reduced and are still on the decline.

The question of decreased assessments is a very complicated one. As a rule assessments were on the increase below 23d Street up to about 1910.

The increase from 1895 to 1910 amounted to about 45 per cent, roughly speaking. Since 1910 the decrease in the assessed valuation has been at the rate of 10 to 25 per cent a year in some years, and five per cent in other years. Today the decrease in assessments is about 40 per cent from that of 1910. Above 23d Street the assessments were gradually raised until in 1912 they reached the maximum in the district between 23d and 30th Streets. During seven years assessments were increased by from 20 to 60 per cent, according to location, averaging about 35 per cent for the block square. The first cut in assessed valuations between 23d and 28th Streets appeared in 1914, and 1915 and 1916 present some more cuts in assessed valuation. On the average, the reduction in assessment for taxation purposes amounts to about 28 per cent per square block, and specific cases of decreased assessments are to be found everywhere. Practically none of the buildings erected prior to 1910 is today assessed at more than about 65 of 70 per cent. at the utmost of the assessed valuation in the period from 1910 to 1912.

According to the Real Estate Record and Guide land value maps in 1911, five years ago, the front-foot value for assessment purposes of lands along Fifth Avenue ranged from $8,500 at Twenty-sixth Street (Madison Square) to $17,000 at Thirty-fourth Street. Today they are appraised by the same authority, the Tax Department, at from $6,300 to $14,000.

Owing to the factory invasion and the decline in values the Fifth Avenue real estate market has been stagnant below 34th Street. There has been little change in the owners of property during the last two years in the region lying between 14th and 34th Streets. But during the last three years at least eleven parcels of land with the buildings erected thereon were sold at auction in proceedings to foreclose the mortgage. The equities in the properties, after deducting the first mortgage, which amounted to about 50 to 60 per cent of the assessed valuation, were wiped out.

Let us take a few specific instances of reduction in assessments. The building at 34 to 46 West 23d Street, the old Stern Brothers building, decreased in valuation from $3,330,000 in 1908 to $1,119,000 in 1915. The property at 27 to 29 West 16th Street, on which there is a practically new factory building, in 1908, before the improvements had been put in, was assessed at $118,000, and in 1909, after the improvements, at $248,000, stood on the tax books in 1915 at $190,000. The building at 186 Fifth Avenue, southwest corner of 23d Street, assessed at $620,000 in 1908, stands now at the assessed value of $220,000.

General desirability of stability of use in districts

In this city, as in any other city, stability in use of certain geographical sections makes for stability in values and stability along certain lines of business. The downtown section, for instance, which has been now for nearly a century the financial center of the city has as a district undergone few vicissitudes from the point of view of property and rental values. As an example of the contrary policy, we have the district lying around Canal and Walker Streets, west of Broadway, which today is practically empty and unused. This is a great detriment not only to the owners of the property there, but also to the city on account of the loss of taxes. Wherever there is any district where any attempt of permanency is made values are apt to be stable or to rise and the district has an architecture of its own suitable to the uses to which the buildings are put. An incentive is also given to builders to put up as good buildings as can be profitably erected. On the

other hand where districts jump from one part of the city to the other values and appearances must necessarily suffer. Everybody wants to get the benefit of the new district right at the start. Speculative and cheap buildings are encouraged and ultimately both the city and the property owners sustain losses.

And what of those whose security for loans is real estate, the thousands of smaller investors in mortgage loans, the scores of great financial and insurance institutions who hold mortgages? Why, the future of their investments may be as insecure and unstable as water, as has been instanced and mentioned above with regard to lower Fifth Avenue, where many equities have been completely wiped out and more, as has been pointed out above. What chances has the holder of a second mortgage got under present conditions in some districts? And of what use are the best brains, the most expert judgment, the largest experience, and the fullest foresight on the part of officers and directors when they are up against an unregulated, haphazard, kaleidoscopic condition of affairs such as has resulted in the Fifth Avenue district? New York is now like a picture puzzle, the pieces shaken up in a bag and thrown on a table, with the pieces placed alongside each other just as they happen to fall out of the bag. We cannot even now have the perfect picture, but what we can do is to try to fix at least some of the pieces where they belong, and keep them from being shaken up in the bag again.

Transportation of workers

Transportation of the workers is greatly hindered by having the garment factories on and near Fifth Avenue. No workingman can live within walking distance of his employment. From the far outlying districts like the Bronx and Williamsburg, as well as the lower east side, the workers come in crowded cars, elevated and subway trains, jammed to such an extent that the Board of Health has found it necessary to interfere. In most cases it means two car fares on each trip. In good weather the employees may in some cases save one car fare by walking. In bad weather thousands of these are compelled to walk on account of insufficiency of transportation mediums. Lunch rooms are not provided and cannot be provided for in sufficient quantities near the places where these people work. The relatively high rent makes it impossible to utilize a lunch room merely during the noon hour. As a result of the lack of accommodations a great many of these factory employees do not get sufficient or proper food for the noon meal. A large number of them bring their lunches with them and eat them on the streets, adding to the litter thereon by throwing the refuse on or near the curb.

Transportation of goods

If we are correctly informed a large majority of the goods manufactured in the Fifth Avenue district are shipped to points outside of the city and principally in the west. Consequently the factories in the Fifth Avenue district are most unfortunately located from the point of view of their distance from the freight terminals. This handicap is greatly accentuated by the fact that the avenues and streets in the district are already the most heavily congested thoroughfares anywhere in the world, because of the mercantile, shopping and pleasure traffic necessarily concentrating there, and because Fifth Avenue, owing to its central location, freedom from elevated and surface car lines, and for other reasons, is the main traffic artery of the city. This vehicular congestion is infinitely worse above 23d Street than

below it. From the point of view of this long and difficult haul the factories would be best off near the waterfront, but if they are to remain near the avenue they are far better off below 23d Street than above it. Not only would their presence in the other locations benefit the manufacturers, but it would be a tremendous relief to the traffic situation.

The finished garments are transported from the factories, first of all, to a packing house located in the district. It is not often that any one manufacturer ships a car load or even three or four cases to the same destination. In order to receive more favorable rates it has become customary for the various manufacturers to ship their goods in small quantities to one of the several packing houses which specialize in this kind of freight. In this packing house are delivered the goods of three or four or even two dozen manufacturers, where they are repacked again and finally delivered to the receiving stations of the railroads or the steamships, on the North or East River, where most of the receiving stations are located. All this means double handling and double hauling and a double strain on the traffic situation.

Proximity of buyers

It has been said that one reason that the factories located in the Fifth Avenue district above 23d Street was that manufacturers of garments must have their factories located within easy reach of the hotel district and the retail stores; that no buyer coming from out of town will go very far from his hotel to buy his goods; and that in order to buy intelligently the buyer must be close to the retail district in order to see the variety of styles. This argument sounds plausible, but a little investigation will quickly show the futility of it. Of course, in the old days, the buyers who stayed in uptown hotels were a long way from the factories. But referring to the present, in the Fifth Avenue Building, to speak only of one instance, there are a number of salesrooms maintained by garment manufacturers who make their goods hundreds of miles away from New York. They find no difficulty in getting buyers to come down and look at their goods. Strange to say, the very New York retail houses, in whose vicinity garment manufacturers are located, find it to their advantage to buy their goods as far out of town as Cincinnati, Rochester, Baltimore, or Cleveland, not to speak of Philadelphia. There is no sound reason why a manufacturer cannot logically do all his manufacturing where the rent is cheaper, where a workingman can live closer to his work, and where his overhead expenses are greatly lowered. If need be, should the manufacturer be too far away from the general vicinity of the buyer, there is nothing to prevent him from having a salesroom and office on or near Fifth Avenue.

Difference between garment-factory workers and office and retail-store employees

There is a decided difference in the character of the employees working in offices, retail stores and factories. By habit and training the employees in offices are courteous, mindful of the rights of others and not prone to interfere with the orderly and regular use of the streets. To a degree the same holds true of employees in the various retail stores. They are mostly the products of our public school system and have learned their lesson in behaviour. When we come to the garment factory employees we are confronted with the fact that the vast majority of them are relatively recent immigrants and not many of them are familiar with the English language. They do not readily fit themselves into the conditions which are so different from those under which they have lived in their native coun-

tries. But among the garment workers a distinction must be made between the younger generation and the older. The women in the trade are of a better fibre than the men. As a rule, in their contact with other people, they are less prone to make themselves offensive. As a matter of fact certain particular trades, in which the majority of the employees are women, are not objectionable from the point of view of the noon-hour congestion. As a rule these women eat their lunches in places set apart for them in the factories. Quite a number of employers have provided sanitary and healthy, even attractive, lunch rooms for their female employees, and at the present time the Labor Law prescribes lunch rooms and rest rooms in every factory which employs more than 20 women. Of course, even at the best, the women add to the congestion of the streets in the morning and in the evening. They form a material percentage of the crowds which seek transportation in the street cars, subways and elevated trains and they are seriously endangered by the risk of fire or panic in any of the tall buildings.

The men, however, do not find lunch or smoking rooms provided for them in the factories. They are compelled to go out in the street. A few experiments have been tried along the line of using the roofs for these men. In each instance, however, the experiment has failed. The roofs are not capable of accommodating the large mass of men who work in one of these buildings. At the best, the expense of strengthening and properly safeguarding the roofs to make it possible for a large number of the men to congregate on them is costly, and they would in addition have to be roofed over to protect them from the elements. So the attempt to take the men off the streets and have them congregate on the roofs has met with no success.

Necessity for preservation of the Fifth avenue district as the retail center

The high-class retail stores which have been forced, by the invasion of factories, to move further north on Fifth avenue have now reached the limit of their northern migration. When the sections below 23d Street, and then in turn between 23d and 32d Streets, were invaded by factories there was a stretch from 34th to 59th Streets into which the retail stores could move. This section, however, is now fairly well built up. Incidentally it may be remarked that this is the only section of the city where assessed valuations have been rapidly increasing during the last three years. Should factories be erected to encroach further on this territory the retail stores must look for an entirely new section in the city. Central Park is a barrier to all trade. On the east side of Fifth avenue, facing Central Park, are the very costly homes of our citizens, and still more costly apartment buildings are now being erected there. These two barriers prohibit the migration of retail stores above 59th street. It is hard to think of any locality which would be available should the territory from 34th to 59th Streets be further endangered by factories.

This is not a local question—it is a matter affecting the entire city, yes, the whole country. It is in the interest of all that this district shall be preserved as the great retail district of the city and country. It is impossible to foresee or prophesy what will happen if the northerly spread of factories is not checked in the immediate future. Hundreds of millions of dollars are invested in the greater and smaller retail businesses in this district, and hundreds of millions have been spent in the erection of beautiful store buildings intended to be permanent, as well as on churches, clubs, hotels, public buildings and residences. To endanger these investments, to

Fifth Avenue, at 31st Street—12:30 P. M.

Sixth Avenue and 27th Street.

FIG. 53—LUNCH HOUR CROWDS OF FACTORY WORKERS.

alter the character and ruin the beauty of this section would be a public calamity affecting not only the whole city, but it would be felt and deplored by the entire nation, which is bound up to this retail centre of the country by many commercial ties and which has a just pride in its most famous and historic thoroughfare.

Other districts more suitable for factories

The logical place for factories would seem to be in the neighborhood where the workers live. New York City is fortunate in having a tremendous waterfront where shipping facilities are of the best. Whether it be possible to move the factories to or near the waterfront is doubtful, but it is unquestionably possible to have factories near the places where the people live. The great east side, parts of the west side, the Bronx, Brooklyn and Queens, as well as Richmond, give plenty of opportunities for the erection of factories at not too great a distance from the workers. It is quite possible to have the various industries located in groups. Let the clothing industry be in one section of the city, the printing industry in another, the leather industry in still another, and so on. This has been accomplished in certain European cities. In our own cities, trades and businesses already congregate in groups. We find the wholesale district, the silk district, the coffee district, the drug district, the leather district, and so on, in well defined localities, and there is no reason whatsoever to doubt that the industries could be grouped in a similar way.

If the garment factories are to remain in the Fifth avenue district at all they are far better off below 23d street, assuming that proper buildings will be constructed there, than they are above it, in the district from which the Fifth Avenue Association has requested that they be excluded in future, for the following reasons, among others:

1. Because they would be arousing no opposition or hostility on the part of the public, the city and the business interests from 23d to 59th Streets.
2. Because they could not do any harm there to values, appearances and in other ways that has not already been done.
3. Because they would fit in with the general city plan and there have a district of their own.
4. Because it would help to solve the problem of the transportation of employees and a very large percentage of the workers would be within walking distance of their homes.
5. Because the vehicular congestion is infinitely less there than in the district above, and the transportation of goods to terminals could be more easily and quickly effected.
6. Because rentals are cheaper below 23d Street.

Between 12th and 23d Streets buildings used exclusively as offices or salesrooms bring the rental of about 85 cents per square foot on the avenue and 70 to 75 cents on the side streets. Manufacturers pay between 65 and 75 cents per square foot. From 23d to 34th Street, office buildings and salesrooms pay about a dollar to $1.20 per square foot on the avenue.

Police power

It requires but little thought or study to see that every one of the arguments covered above, save that of " Proximity of Buyers," is based directly on one or more of the elements of the police power, such as the public health, safety, comfort, convenience and general welfare. They may be grouped roughly as follows:

West 26th Street, Between Fifth and Sixth Avenues.

27th Street, Near Madison Avenue.

FIG. 54—CONGESTED SIDE STREETS IN FIFTH AVENUE DISTRICT.

Congestion in Factories Transportation of Workers Differences Between Garment Workers and Other Employees	Health, Safety, Comfort, Convenience.
Pedestrian Congestion Vehicular Congestion Transportation of Goods	Safety, Comfort, Convenience.
Reduction of Values Desirability of Stability of Use Districts Aesthetics Connected with the General Welfare Necessity of Preserving the Retail District Necessity of Protecting Hotels, Churches, Clubs, etc.	General Welfare.
Other Districts More Suitable	Health, Safety, Comfort, Convenience, General Welfare.

STATEMENT BY JOHN T. FETHERSTON, COMMISSIONER, DEPARTMENT OF STREET CLEANING, MAY 22, 1916

Economy in street cleaning

I would say, in general, that the development of the zone system involving an orderly arrangement of building uses, should ultimately tend to economy in the cleaning of streets and in the collection of refuse by providing a basis for a work plan which will meet particular conditions of each district or section. I can illustrate this by stating that where congestion exists on account of height of buildings there may be in the same locality other types of structures which might better be served by a method of street cleaning or refuse collection not suitable for the congested building district, yet the department to-day has a large compromise system which is not so economical as if all the districts were homogeneous.

Difficulty of keeping streets clean in mixed districts

It is more difficult to keep a mixed district containing stores and dwellings clean and sanitary than a residential district. That is apparent all over the city. The demand for sanitation varies with building occupancy. A residential street requires at least a higher standard of street conditions than would a business or a mixed type of street. A great many complaints come to the Street Cleaning Department from streets where mixed business and residential occupancy is in force.

In the heavy traffic districts there are streets where it is hardly possible to clean the roadway during the day time on account of the procession of vehicles which prevents the cleaners from collecting the street dirt. On that type of street the same sanitary conditions cannot be maintained as in a residential street.

In the case of mixed occupancy of a particular block (residence, business and factory use) the factories and business places in that particular block tend to bring heavy traffic into the block and make it difficult to keep it in the best sanitary condition. The cost of cleaning a mixed street is greater than one used wholly for residential or industrial purposes.

Location of garbage plant

There is one item which might be advanced for the consideration of your Commission, and that is the possibility of setting aside some location in the city for the disposal of the city's waste.

For six months the city has been struggling to let a contract for the disposal of garbage from the boroughs of Manhattan, Bronx and Brooklyn, and for at least four of the six months the city has been defending law suits brought by property owners in the location where the plant was proposed to be erected. Every locality demands garbage and rubbish and ash removal and the work must be done expeditiously and regularly, regardless of conditions. Necessarily this material must be disposed of in some way. Yet, local sentiment is so strong and brings such power to bear upon officials that every locality in the city objects to the erection of disposal works within its particular confines.

In the present instance three sites suitable for the erection of a garbage disposal plant were proposed: First, Riker's Island, between the East River and the Long Island Sound; second, Barren Island, in Jamaica Bay; third, marsh land on the westerly side of Staten Island.

The city has used Barren Island as a garbage disposal location for over twenty years. The residents of that locality have sought relief from the nuisances which existed at the old plant, and have repeatedly brought suits against contractors as well as the city to abate this nuisance.

In the latter part of last year the city recognized the necessity for improving the treatment of garbage and eliminating the existing nuisances. Two contracts were advertised, one of which was for the erection of a plant on Riker's Island, and the second allowed the contractor to erect a plant in any suitable locality except Jamaica Bay and the Borough of Manhattan. The Board of Estimate approved Riker's Island as a suitable location for a garbage plant, but the Board of Aldermen, influenced by local sentiment in the Boroughs of The Bronx and Queens, refused to ratify the contract. The only alternative left was the acceptance of a proposal for a garbage plant on the westerly shore of Staten Island, in an isolated location. This particular contract was approved by the Board of Estimate and Apportionment, but the contractors have been delayed in the construction of the plant on Staten Island on account of local objections. So that the three available locations now existing within the city limits which are suitable for a garbage disposal plant have all been objected to by residents of the adjoining localities. In each case the garbage plant would be situated in an industrial and waste land section, with very few houses within a mile of the plant.

I believe that the treatment of garbage has progressed to a point where modern methods of treatment will eliminate nuisances, and as the health of the whole community is involved it may be possible for your Committee to set aside a locality where the treatment of waste materials may be carried out economically and with the greatest conservation of properties. In other words, a waste treatment zone might be considered as part of the city plan and a location so selected as would have the least adverse effect upon other properties within the city limits.

Statement by John C. Gebhart, Secretary, Tenement House Committee, Brooklyn Bureau of Charities, April 4, 1916

More stringent area restrictions desirable

The Tenement House Committee of the Brooklyn Bureau of Charities is particularly interested in restricting congestion in Brooklyn. We know there is still a great deal of undeveloped territory in Brooklyn and that in a sense Brooklyn is therefore the hope for the housing of the future popula-

tion of New York City. We believe that the tentative restrictions that have been imposed by the Commission are not nearly severe enough. In most cases the restrictions are much more lenient than the type of building that is now being erected in the various sections, with the exception of the "E" district restrictions. The greater part of Brooklyn is covered by "C" districts, and yet the "C" district restrictions are not effective below the fifth story. From that point they are not so much greater than the restrictions now imposed by the tenement house law, as to check land overcrowding to any extent.

Our Committee has recently had a study made of congestion in the newer tenements in Brooklyn. We find they are building in certain sections of Williamsburg six-story "walk-ups," housing from 25 to 35 families. Now, of course, we don't want to see that sort of construction repeated in the undeveloped sections of the borough. Yet there is nothing in your recommendations to prevent that sort of construction in sections now devoted to one and two family houses and small tenements. We were surprised in making a study of the "D" districts to note that even in these districts a rather intensive type of construction would be allowed. In the "D" district houses may occupy only 60 per cent of the lot, while the tenement house law permits 70 per cent of the lot to be occupied. Yet on 60 per cent of the lot a four-story tenement, housing four or five families on each floor, could profitably be built. That is to say, so far as your recommendations are concerned, one could build 16 and 20-family tenements in these sections which are now for the most part given only to one and two family houses, and which, according to the report of the Commission, it is your desire to retain for such use. On the other hand, your restrictions would make it practically impossible to build a three-family tenement in a "D" district. You would have to provide a court 15 by 15. On 20 and 25-foot lots on which these three and six family houses are usually built, it would be impossible to build a house with that size of court which would be a paying investment. Your restrictions would make it impossible, therefore, to build the smaller type of tenement in a "D" district. At the same time they would allow and would furnish an incentive for the larger type with four and five families on a floor. This of course defeats the very purpose of your Commission. We believe the restrictions should be so framed as to discourage large tenements and encourage small ones in "D" districts.

We concur pretty generally with the report of the Brooklyn City Plan Committee. We believe, generally speaking, that most of the districts which are now designated by "D" ought to be made "E" or villa districts, and most of the districts which are now "C" could very well be made "D" districts. We have not yet worked out a definite plan, but we shall be pleased to submit one within a few days. We want to save New York City from the large tenement house and do not want to see these great tenement houses appearing on land which is undeveloped and where land values, the economic trend and the public interest do not warrant such a high rate of congestion.

Advantage of uniform area provisions for all buildings

The erection of factories adjacent to tenements to a large extent nullifies the advantages obtained from the Tenement House Law. This is especially the case where the tenement house has been built with an inner court on the lot line; a factory can come along and shut off the light that theoretically should come from the neighboring building. There are a good many cases

of that kind. Besides, residence streets have been ruined, made unattractive and undesirable by the invasion of undesirable trades and industries which have no place there.

Larger courts and yards in lieu of parks

Many one and two family house sections have large open spaces in the rear or front where the children can get recreation and fresh air. If we are going to allow these sections to be taken up by large tenements we are going to take away that feature from their lives. The relatively small park acreage of Brooklyn should be considered in this connection. In Brooklyn only 2.29 per cent of the area is given over to parks, whereas in the Bronx 15.13 per cent and in Manhattan 10.25 per cent is reserved for such use. It is necessary, therefore, to compensate for this loss by providing larger open spaces about the houses. This we feel you have not sufficiently considered in your recommendations.

Overcrowded schools

In some of the congested sections of Brownsville, the schools are not only overcrowded, but overcrowded to the extent of violating the Sanitary Code. Many of the rooms have a placard which says, "legal capacity 45," yet they probably have 60 children. This condition the Department of Education has to meet as best it can. The point is that the neighborhood is too congested for the school facilities which the city can provide. Besides, many children can go to school only half-time because of the overcrowded condition. By spreading the population over wider areas and in smaller housing units this problem would at least be partially solved.

Statement by Ernest P. Goodrich, Consulting Engineer, March 30, 1916

Height limit will stabilize real estate values

I believe that a limitation of the height of buildings will stabilize conditions and consequently make rents and sale values more uniform, and thereby remove that condition which is called a gamble in real estate. To that I attach very great importance and believe that there will not be so many changes in occupancy if we have these height restrictions.

Traffic

I am more familiar with traffic conditions. Traffic conditions make real estate values. In Newark where we took traffic statistics, one of the requests that was made was by the Board of Appraisers, who wanted to modify their appraisals on the basis of the people who walked in front of the show windows, believing that a larger number made property of greater value. I can give you an instance in connection with the Borough of Manhattan. One man came to the office and objected to an encroachment removal. When the statistics were shown him that 35,000 people walked in front of his window, he scratched his head and said, "I will raise the rent" and the consequence was that without further objection he went back and removed the encroachment.

Relation of districting to health

You are endeavoring to arrange this limit on the basis of business policy, so as to conserve health and preserve life and limb and thereby con-

serve property. The conservation of life and health is through reduction in crowds, both in buildings and on the streets of the City.

I want to call your attention to the report of the Board of Health of February in which some observations on the recent outbreak of grippe are discussed. In that report the congestion of pedestrians, particularly in the street cars, is cited as the probable cause of the rapid spread of the infection. The health matter, therefore, is of intimate relationship to the number of people who occupy the street cars and who move about the streets. It also has to do with accidents to pedestrians crossing the streets, and, in connection therewith, the number of vehicles which use the streets.

Street accidents

I exhibit for your information the number and locations of fatal accidents from vehicles in the Borough of Manhattan during the year 1913. If you study this carefully you will find that accidents vary, first with density of population, and second with density of vehicular travel, as well as with pedestrian travel.

A careful study of this map would be very illuminating as to conditions where building heights should be restricted on the basis purely of the accidents which happen every day.

Danger of panic

Panics have occurred within the memory of all, at the Baltimore fire, the Charleston earthquake, and the San Francisco earthquake and fire. We often hear the statement made that New York is not subject to earthquakes. The same statement was made with regard to Charleston that it was impossible. Now, it was not impossible. New York may have an earthquake as well. Almost anything that can be done to prevent panic under such circumstances will be considered by the court as entirely proper and reasonable.

Determination of height limit

This has a relationship, not only to the maximum limit of building heights, but it has to do with conditions in the buildings. If you simply place a maximum height, without relation, for example, to the present maximum height, you are raising the factor of loss and of difficulty up to that probable maximum. It seems to me that the reasonableness of the case should dictate to you reducing the height limit below the maximum conditions which now exist. If three buildings out of fifteen exist which are over the limit which might be more or less arbitrarily fixed, it would seem to me that the thought of what would happen if all buildings were raised to the present maximum, would dictate also a limit within that present maximum, and the court would sustain you in reducing such limits.

The conservation of property is always acknowledged as a proper exercise of the police power with reference to fire losses, and thieving of course. We know that pickpockets frequent crowds. Perhaps it is a long stretch of imagination, that building heights should be restricted to prevent pickpockets. It is entirely within the police power, and it should be so considered.

My idea as to the proposed height limit is that it is too high. I would take a district of a dozen blocks and analyze it roughly and if fifteen per cent of the frontage exceeded a given height, I would use that height as a limit, and let the higher buildings remain, but limit height in future to the lower level.

Regulation of traffic

The regulation of traffic has come to be the most important exercise of the police power. It is not primarily now-a-days for the prevention of loss of life and prevention of accidents, but has to do with the expediting of travel so as to save money to the public. It is not entirely the conservation of life and limb. It is the conservation of property indirectly. When the police power is accepted by the people to this extent, it seems to me that it is logical that regulation of those things contributing to the congestion in the streets and consequent loss of money to the people who use the streets, should be considered a reasonable exercise of the police power.

Sidewalk congestion

Take the ordinary sidewalk, which in most of the streets downtown is fifteen feet wide, and assume the normal rate of speed of pedestrians walking along the streets to be two miles an hour. I have made many observations, in Boston, Chicago, and elsewhere, but the ordinary congested condition of the streets causes the average speed per person to be less than two miles per hour and it runs down to one and a half miles an hour. Of course, a person walking rapidly may do three miles an hour, but that does not occur normally. A person on a street where such conditions exist has only eleven square feet of space in the street assigned to his use. We know that in buildings the limit is thirty-two square feet for most manufacturing uses. In other words, our streets are not as well off from a health point of view as buildings are, under present conditions.

The question as to what is a congested sidewalk is particularly interesting, and the problem has been approached in this manner. A diagram was prepared of conditions on Nassau street such as exist every day. Pedestrians on one side of the street are shown in red, and on the other side blue; north and south bound differently indicated in each case. Those who are pushed off into the roadway are shown in the center, north and south bound separately. You will notice at a certain time of the day the number of persons in the roadway suddenly jumps. At the same time those on the sidewalks also jump in numbers. Conditions for some time previous to that particular time on both sides of the street show a less number of people on the sidewalk. That is, during the previous fifteen minute interval. Therefore it is natural to assume that when the conditions of the sidewalk are as indicated by the diagram on the two sides just preceding the period when they tumble off into the roadway, a condition of congestion exists there. People seem naturally to avoid any further congestion on the sidewalk. If we assume the condition indicated on the diagram as a congested condition, we can work out statistics which will show that in case of panic, conditions are almost impossible. This measure of congestion is figured at four and a half to six persons per foot of width of sidewalk per minute and all encroachment removal work comes down to that figure. We don't remove encroachments unless the number of persons on the street during the most congested fifteen minutes of the day exceeds six persons per foot width per minute, and naturally they are then being pushed off the sidewalk into the street.

If we assume a fifteen foot sidewalk with a certain amount of lost room because of encroachments against the buildings and hydrants against the curb, only twelve feet of space usually remains and if we assume five persons per foot wide per minute, that means sixty people per minute will pass a given point. Some of the points on the diagram run as high as fifteen

per foot per minute. One place of tremendous congestion is the approach to the Brooklyn Bridge, another is on Fifth avenue during the lunch hour. I have studied conditions at 23d street and Fifth avenue and I can give you statistics on that also.

A ten-story building one hundred feet deep will have on a strip just one foot wide 1,000 square feet. At 33 1/3 square feet per person, that means a maximum of thirty persons per front foot of street space for a street that is filled with ten-story buildings. Now, at thirty persons per front foot on a basis of sixty persons per minute along a sidewalk, there will be required from 1/6 to 1/2 a minute per person per foot front to carry away the people. An 800-foot block would require from four hundred down to one hundred and thirty minutes to empty one side of the street. That means from six hours down to two hours according to the rate at which you figure people to move, assuming all were on the sidewalk. Six hours down to four hours is the time if sidewalks only are used, and four to two if they cover the whole street. If, on the other hand, there is a panic, the whole street would be absolutely jammed with people in the majority of streets in lower Manhattan, where I may say 750,000 people from the outside come in every day for business.

It would seem to me that the Commission would do a service to the community by saying that in case of panic every employee should go toward the waterfront, away from the large buildings—go as directly as possible to those districts where the buildings are lower and not to move through the obvious lines of communication.

Special conditions such as those on Nassau Street, in which we have very often had fifteen persons per foot width per minute, are exceedingly common. On Fifth Avenue—at the southwest corner below 23rd Street, from twelve-thirty to twelve forty-five on April 29, 1915, there were ten and a half persons per foot width of sidewalk per minute. At that intersection the heavy stream turns from the west where it varies from seven and a half to nine and nine-tenths, and it went as high as thirteen and a third at one particular point along Fifth Avenue. In 1911 (and conditions have not changed in some ways, and have materially changed in others), the number of pedestrians varied from 33,000 at 14th Street to 14,000 at 23rd Street, 26,000 at 33rd Street, 24,000 at 42nd Street, and then down to 2,000 at 78th Street and up again to 18,000 at 116th Street. But you must take into account not alone the people on the street, but the vehicles also. It is the combination, and the pedestrians crossing the street that make for accidents. I could give you statistics on that also.

Population of Manhattan

Single block lengths where residences now exist should be restricted for residence use. If the people have to go clear across Manhattan to get from their work to their residence, as they do now across 14th Street, acute congestion occurs steadily. If, however, every third block north and south were made a business block or a manufacturing block, and the intervening two blocks residences, each person could live within two blocks of his work and there would be no such congestion as there is at the present time. I think that would be a very important thing for the good of the community as a whole. I decry any of the talk about loss of population in Manhattan. We have made a special analysis in my office showing the available unbuilt-upon spaces. They would house one and a half million more people, if all vacant spaces were used. By simply tearing down the old two and three story houses and putting up five story tenements you

could house another three-quarter million. There is no reason at all for Manhattan's falling off in population from a congestion point of view. The only thing is proper distribution by not focusing all the residences in one part of the island, the business section in another part, and the manufacturing in still another part. Distribute it more uniformly all through the island and you will conserve conditions and it will certainly reduce the congestion in the streets.

Statement by Madison Grant, Chairman of the Executive Committee, New York Zoological Society, May 5, 1916

Protection of park areas

I feel reasonably certain that the courts will sustain restrictions designed to maintain the character of parks or parkways. Where the city has spent huge sums for the purpose of acquiring land for parks and parkway purposes, it seems hardly reasonable to suppose that the courts will regard as unreasonable any limitations imposed upon the borders designed to maintain them as recreation or park centres. The general value and use of parks and parkways are to the city as a whole rather than to their immediate boundaries and the local interests therein. It would be a very serious matter for your commission not to do everything possible to preserve the parkway character wherever it can be justified.

Statement by Julius Harder, Architect, May 5, 1916

Lot and block unit

To begin at the beginning, a commission with as broad functions as has this one, may properly formulate general and fundamental recommendations which would be preventive of at least some of the ills which this commission seeks so far as possible to prevent in future. As a first proposition I would advise the general adoption of 20 feet as the unit of lot width instead of 25 feet, and as a second, the adoption of 240 feet as the standard block width in place of 200 feet. The advantage is not susceptible of mathematical demonstration. It is a fact, however, that architects generally in planning buildings upon lot areas have found the 20-foot width much more mobile—the 150-foot depth too great as against an insufficiency in the 100-foot depth dimension. While elusive of exact analysis it appears nevertheless true that there exists a relation of the "human scale" to lot area, which is much more in harmony with a 20 by 120-foot unit than the 25 by 100 feet.

Such a recommendation might still be productive of good results in Queens and Richmond. There is a notion abroad that the City Topographical Departments design the street plan. Such is not the case. The city only "accepts" the new streets after the first "possessors" have displaced the stakes planted by the half-paid surveyors in the employ of the early real estate speculators, when it is already too late to correct the general street plan without moving all the buildings. What the situation may be at the moment as to Richmond in this regard I do not know, but as to Queens, I do know that hundreds of land tracts just in process of transition from farm land to building lots have laid down the unfortunate 200-foot block width, and if nothing occurs to alter the usual course of events, these must all in course of time be "accepted" by the City. This situation might still be saved by appropriate action.

Value of different kinds of courts

Approaching the subject of free air space of tenants I would urge the recognition of the following general principle as fundamental, that is:

A "through court," extending from street to yard is twice as good as an "outer court." An "outer court" is twice as good as an "inner court."

In practical effect the "through courts" would be given preference, as against the penalization of the "inner courts." It would encourage "semi-detached" planning in the form of isolated and lesser units. This would result beneficially not only with reference to light and air circulation, but also as to accessibility, sanitation and fire hazard. Financing, ownership and marketability become more mobile. The "inner court" on the contrary makes for larger units and, by duplication, for the enclosure of the entire block area, the "rear yards" themselves becoming aggregated into an "inner court." If this principle were established the difficulties relating to outer courts would disappear. Designers would favor the through courts and plan the principal rooms upon it, leaving baths, staircases and smaller rooms to find a location upon the inferior court for which the present requirements of the Tenement Law would be ample.

Minimum dimension of courts

The determination of the related minimum dimensions of yards and courts depends entirely upon what skillful planning permits of as feasible. Obviously the least dimension of the court should bear some relation—first, to the depth of the room space located upon it, and secondly, to its other two dimensions. No scientific rule as to this has been devised, so far as I am aware, which would apply at all reasonably to a wide diversity of lot dimensions, to say nothing of a wide diversity of uses of buildings. The present tenement rule was born of a large number of plans submitted in competition for standard tenements by over 100 architects and was made to fit specific types of tenements about six stories in height upon 25 by 100-foot lot units. The 12-story tenement of Manhattan and the blocks of various shapes and dimension in Queens and Richmond were not considered at that time and the Tenement Law does not fit these cases.

If it be the object to hold an outer court above a fixed minimum, it would be more certain of operation to fix an arbitrary minimum width of five, six or seven feet, particularly as the height also enters into consideration. In practice it is found that long outer courts occur with low buildings, while the shorter and wider courts accompany higher structures. Perhaps a rule something like this would work out acceptably:

The minimum width of a "through court" shall be 4 feet.
The minimum width of an "outer court" shall be 6 feet.
The minimum width of an "inner court" shall be 10 feet.
A limitation of length may thus be omitted.

Statement by Edward R. Hardy, Assistant Manager, New York Fire Insurance Exchange, May 22, 1916

Districting will reduce fire waste

Any plan which would establish a uniform character to a district as to height, use and occupancy, will, in the main be beneficial in reducing the fire waste. This is due primarily to the fact that with no restrictions there creeps into business districts businesses which are altogether out of proportion to the ordinary fire risks in that district. That is, they threaten the whole district, as a block may be spoiled from a fire standpoint, by a single

industry carried on in that block. Again, it will tend to make the problem of furnishing adequate fire fighting facilities simpler if we have the restricted zones. There is not needed in a true dwelling district the amount of apparatus, nor of water supply that is needed for the industrial or business districts, but, with no restrictions it is practically necessary to furnish the same facilities for the whole city. With restrictions the fire department will also be able to better concentrate its forces for handling the different districts where an entire district is subjected to the same use.

Effect of business on insurance rate

The rate of insurance in a store and dwelling building reflects greater insurance risks. The ordinary private dwelling, now accepted as a building occupied by not more than two families, changes its character, so that the first floor or basement is occupied for a store, with one family above, the insurance rate is about twice as much as when it was occupied wholly for dwelling purposes. This is due to the fact that the store brings always an unknown quantity of waste material, poor protection to stoves, gas lights, care of ashes and ordinary accumulations—the risk is about two to one.

Fire statistics

Even if special precautions are provided to prevent the spread of fire from the business building to the tenement above, there is great danger, especially to the occupants of the tenement. The proposition frequently advanced that the first floor is so protected that there shall be no communication when there is a store in the basement with the floors above, overlooks the fact that in a fire the smoke will always seek any exit available. It will ascend naturally if there is a way. If not, it will pour out of the doors and windows and follow up the side of the building and enter the living floors in that way. Some of the most serious panics have been due not to fire but purely to the smoke condition.

In connection with this subject a report of the Bureau of Fire Investigation of the City of New York, for the quarter ending March 31, 1916, is herewith submitted. It gives the character of the stores in which fires occur, showing that out of a total of 375 fires, 291 originated in stores situated in residential buildings.

One thing that stands out prominently from the Fire Chart of the Borough of Manhattan, prepared by Mr. A. Niflot, for the years 1910 to 1912, is that those districts occupied by the mixed conditions, as stores and dwellings, have by far the larger number of fires proportionately than any other portions of the territory shown. Where the use is uniform, that is, either dwellings, business, or manufacturing, there is then an appreciably less number of fires than in the mixed districts.

PART OF MAP
SHOWING THE NUMBER AND LOCATION OF FIRES IN THE BOROUGH OF MANHATTAN DURING THE YEARS 1910, 1911 and 1912

From the Fire Chart of A. Niflot

Each dot represents a fire and its location

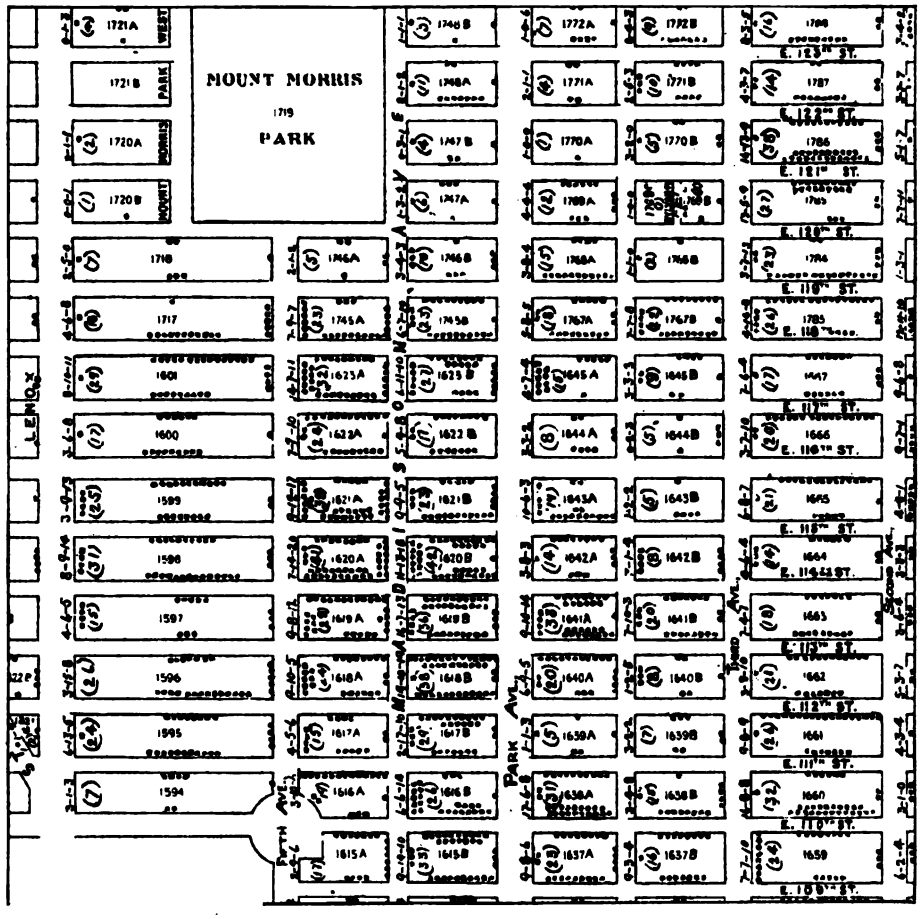


FIG. 55.

A comparison of this map with the Building and Transit Development map prepared by the Commission, shows that the blocks between Fifth Avenue and Lexington Avenue in which a large number of fires occurred had many stores on the ground floor of the tenements, and that where such stores were absent the number of fires was much less. This deduction is confirmed by a careful study of the entire map and indicates the importance of districting in such a way as to exclude stores from tenements.

BUREAU OF FIRE INVESTIGATION, CITY OF NEW YORK, QUARTER ENDING MARCH 31, 1916

Character of Stores in Which Fires Occurred

	Dance Halls	Dwellings	Factories	Factories (Tenant), Loft Buildings	Furnished Room and Boarding	Office Buildings	Store Buildings	Tenements	Total
Automobile Supplies	..	..	..	1	..	..	..	1	2
Bakeries	..	3	..	..	..	..	..	7	10
Barber Shops	..	2	..	1	1	..	..	4	8
Billiard and Pool	..	..	..	..	..	..	..	1	1
Butcher Shops	..	2	..	..	..	..	1	7	10
Cafe, Liquor Stores	..	5	..	4	..	..	2	17	28
Cigars and Stationery Stores	..	6	..	4	2	..	5	30	47
Cloaks and Suits	..	1	..	..	1	..	1	7	10
Confectionery	..	1	..	..	..	..	..	9	10
Cotton Goods	..	..	..	..	..	..	..	2	2
Delicatessen	..	2	..	..	..	..	1	6	9
Drugs	..	1	..	..	..	1	1	3	6
Dry Goods	..	2	..	..	..	..	4	8	14
Dyeing and Cleaning	..	..	..	..	..	..	..	1	1
Embroideries and Laces	..	..	..	1	..	..	1	2	4
Furriers	..	..	..	..	..	..	..	..	..
Furniture	..	2	..	..	..	..	1	5	8
Furnishings (Men's)	..	1	..	1	..	..	..	1	3
Furnishings (Women and Children)	..	1	..	1	..	..	..	2	4
Groceries and Dairies	..	10	..	..	..	1	4	37	52
Hair Dressing and Hair Goods	..	..	..	..	..	..	..	2	2
Hardware, Housefurnishings	..	1	..	..	..	..	1	7	9
Hats and Caps (Men's)	..	..	..	..	..	..	..	..	..
Laundries	..	4	..	..	..	..	1	3	8
Millinery and Feather	..	..	..	1	..	1	1	2	5
Notions and Novelties	..	1	..	..	..	..	4	4	9
Paints and Oils	..	1	..	1	..	..	1	2	5
Plumbers and Tinsmiths	..	1	..	..	..	..	..	4	5
Restaurants	1	3	1	6	2	1	6	12	32
Rugs and Carpets	..	..	..	..	..	..	..	..	..
Shoe and Leather Goods	..	3	..	1	..	1	..	8	13
Sporting Goods	..	1	..	..	..	..	..	..	1
Tailors (Men's)	..	2	..	1	..	..	4	13	20
Tailors (Women's)	..	1	..	..	..	..	..	9	10
Tailors (Trimmings)	..	..	..	..	..	..	..	..	..
Upholsterers	..	..	..	..	..	..	1	..	1
Miscellaneous	..	5	..	2	..	1	5	11	24
Woolen and Worsted Goods	..	..	..	..	..	..	..	1	1
Knitwear	..	..	..	..	..	..	..	1	1
Total	1	62	1	25	6	6	45	229	375

Statement by Rowland Haynes, Secretary, Committee on Recreation, Board of Estimate, April 18, 1916

Residential streets as playgrounds

The advantage of use districting to the whole recreation problem lies in having reserved residence streets. Thus it is going to be possible, since the delivery traffic in such streets will be comparatively light, to use some of them for temporary play places, as was done by the Police Department in about 25 locations last summer. The only thing I wish to emphasize is the urgency and importance of such possibilities which are opened up by the action of your Commission.

Great need for additional playgrounds

In the first place, we have to realize that through some studies which we have previously made we have found that wherever the density of population exceeds 37.5 per acre, about 80 per cent, in fact, somewhat over 80 per cent of the children have to play away from home, either because there is no space in their own back yards or because that space is so small that they have no chance to play any of the larger space games. Out of the 54 wards in Manhattan and Brooklyn, all but seven exceed that density. If we take the city as a whole, including all of the boroughs, we find that 84 per cent of the population of New York live in districts where the density exceeds this figure of 37.5 per acre. Some neighborhoods in New York go up to 18 times that density. If we take 84 per cent of the whole number of children in this city between five and fifteen years of age as the number living in these more densely populated districts, and if we then take 80 per cent of this 84 per cent as the number who will have to play away from home, we find about 680,000 children in New York City who have got to play away from home. The average daily attendance last summer at all the playgrounds in New York City was less than one-third of 680,000. This includes the average daily attendance at park playgrounds, school playgrounds and playgrounds conducted by settlements and other philanthropic agencies. In other words, all the public and private agencies which we now have are reaching only about one-third of the child population who must play away from home. Seventy-five per cent of these playgrounds close after the summer season. This means that larger opportunities for play are urgently needed. To purchase enough additional places to reach the children who must play away from home would bankrupt the city. Hence we must use more intensively the land that the city already owns. Hence the method which was introduced last summer by the Police Commissioner of using streets reserved for play for certain hours in the day in certain districts must be extended for some time to come. My only purpose in accepting the invitation of your Commission to speak thus briefly is to point out that, while this plan of use districts is worked out for a different purpose, it is going to be of very genuine and fundamental value in improving conditions which we do not like but which we have got to face in the playground and recreation situation here in New York.

Districting will reduce traffic on certain streets

The restricting of residential streets against factories, stores and public garages makes those streets better for play use, first, because it reduces the amount of traffic in those streets. It makes the traffic in those streets simply delivery traffic for household necessities, which is much less than any through traffic, or traffic to garages, or delivery traffic to and from stores.

It reduces the amount of traffic and thus makes the burden of reserving a street for play purposes much less. In the second place it makes possible the reservation for play purposes of residence streets which are near those on which the children are living. In short, it makes possible the reservation of play streets without burden to traffic and near where they are needed.

Streets the only playground for most children

Certain types of stores, namely, those where much loafing is done, have a very undesirable moral effect on the children living nearby. I do not think, however, that the restriction of residence streets against stores will make much difference on that score, because the stores will not be very far away. The corner drug store will not be very far away, even in a residential district. So I think we cannot assume that it will reduce very much the harmful influences that come from some stores.

In a locality that is built up with apartment houses and business places covering from 70 to 90 per cent of the land, where there are no playgrounds, the children are compelled to play in the streets. About 90 per cent or more of the children in the crowded districts play in the street now, if they play outdoors at all, during the seasons when most of the public playgrounds are closed. We feel that it is vital that children should have places in which to play. Ten per cent or more of the school investment in New York City is wasted because children outside of school hours or after school years form habits which waste what they get in school. A very lengthy investigation would be necessary to find the exact amount of the educational loss in this way. Studies which have been made in cities throughout the country show that about 40 per cent of the children, even in cities only one-tenth as big as New York, who are outdoors outside of school hours, are idle because there is no place for them to play. Children who are doing nothing are not developing habits of push and initiative that they must develop in order to use their school training. The wholesome use of out of school time is a big asset to any city.

Dedicating every part of the city to apartment houses would have two effects. First, it would reduce the amount of open space, and second, it would increase the number of children per acre. It would reduce the amount of open space because it would be possible to build up to 70 per cent of the lot. Then, by piling up the homes, the number of children per acre would be very largely increased. Thus the play conditions would become more and more acute and more and more difficult to handle. I should not be advocating play streets if we could afford anything else, but we cannot afford enough play places at present to reach all the children. We must provide some temporary expedient.

Tenement yards not desirable playgrounds

The rear yards provided by the Tenement House Law are neither adequate nor desirable as play spaces. The noise from the playing in such narrowly enclosed areas would be intolerable. One great problem which we have to face, even in a reserved street, which is much larger than the tiny back yard wells you have described, is how to overcome the noise of play.

Minimum play space standards

In London the school board is reported as having set apart a minimum of 30 square feet of play space for each child as a standard. Most

American schools are trying to get 40 and 50 square feet per child for their play use. There comes in the problem of the times in which the play areas are used. That is the reason why we are interested in a duplicate school plan in New York City. With the present system, a large number of children are thrown on small play areas at half past three in the afternoon. If the duplicate school system is extended, it makes possible the use of the small area over and over again. If you have 30 square feet reserved for each child all the time, it uses up a great deal of space, but if you can use that amount of space over and over again by different sets of children through the day, you have an opportunity to make that 30 square feet really adequate and you will not require the 50 square feet which some cities are trying to get.

I usually say that you can handle about 300 children per acre at one time, but that you can count on an acre's handling a thousand children adequately during the day since it is shown that there is a flux back and forth even without the regulated flux which comes with duplicate schools. When I spoke of duplicate schools I was not referring to school problems. I am particularly interested in the duplicate school plan, not from the standpoint of the educational problem, but from the standpoint of the recreational problem. Such a plan makes possible, by co-operation between the School and the Park Departments, the wider use of both school and park playgrounds. For the park playgrounds, it means that instead of having park playground leaders who are more or less unemployed part of the day, we should have park playground leaders who would be employed all day because of the different shifts of children coming to them on the park playgrounds from the nearby schools.

Studies in four or five cities indicate that the average child of twelve years will not go more than a quarter of a mile to play. However, a slight modification comes in time; that is, after a playground becomes established, after the parents become confident of its good management, the children are drawn from a little wider area. But it is true that little children won't go more than from two to six blocks, sometimes less.

Statement by Joseph J. Holwell, President, Greenpoint Taxpayers' and Citizens' Association, April 10, 1916

Need of protecting parks from factories

I feel that McCarren Park ought to be made a great playground. It is the only big public breathing spot we have in the Eastern District. We as a community are not a community of men and women who are able to get out of Greenpoint for recreation purposes. You who are familiar with Brooklyn and particularly the Eastern District know that a manufacturing center is a tenement house center, and that the people who reside in those tenements have not the wherewith in most cases to get out of such a section for recreation purposes. It is considered a great boon once or twice each year for these people to go to Coney Island or Rockaway Beach. Therefore, we must bring recreation centers to them, and inasmuch as the City has paid over $1,300,000 for McCarren Park, I think it should be developed into a great public playground and park. It can be made such by prohibiting the erection of factories in the future on private property fronting on the park.

STATEMENT BY RAYMOND V. INGERSOLL, COMMISSIONER, DEPARTMENT OF PARKS, BROOKLYN, APRIL 10, 1916

Injury done parks by factories

The factories already located on the borders of McCarren Park, and particularly one of them—the Kings County Iron Works—have been injurious both to vegetation and to the recreation activities in that park. The Board of Health has taken action a number of times, but we have not yet obtained satisfactory results. There is one factory that emits smoke and fumes which darken the sky and which leave a heavy deposit of soot, so that within 24 hours after a snowstorm you will often find the snow almost black with this soot. Now, that does not tend to promote the healthfulness of McCarren Park as an outdoor play space, and it seems to me that it would be feasible to put this within your district restricted for residences and business, and exclude industry for the future. Of course, the result of that would be that there will be some industry around the border of the park for some years to come, but some of those industrial plants are gradually becoming obsolete, and if they move away for any reason, we will gradually approach the condition which we would like to have there.

STATEMENT BY RAYMOND V. INGERSOLL, COMMISSIONER, DEPARTMENT OF PARKS, BROOKLYN, MAY 25, 1916

Effect of districting

I believe that, without doing any violence to existing conditions, this plan, if it goes into effect, will check the unnecessary growth of congestion of population in certain sections, diminish the fire hazards, decrease unnecessary street congestion and the dangers from street congestion, particularly to children who have to play in the streets; that it will be a very great aid to the City in properly locating its schools and libraries and other public buildings by its tendency to make the growth normal and to make it possible to anticipate it; in other words, a general substitution of harmony and plan for chaos and ugliness.

Importance of protecting small parks

As the members of this commission know, I have been particularly interested in this plan in relation to the surroundings of the parks and parkways and particularly to the small parks and playgrounds scattered in the various parts of our borough, and I have been in touch with the Commission for a good many weeks on that subject, and I must say that I have been very much gratified that the Commission has seen its way clear to meet the park point of view to so great an extent in regard to the surroundings of these small parks. We have a very wholesome tendency now, noticeable in Brooklyn, to build public and semi-public buildings along the borders of these small parks, helping to embellish them and to make them more attractive and impressive, to protect them from smoke and noise and to make them what they are intended to be, genuine centers of recreation and civic centers for these various neighborhoods. The Commission has met our views in most respects with the exception of one or two small parks located in industrial sections.

I think it is extremely important that we should have a few attractive residence areas around these little parks and playgrounds. It is the natural

place for the best residences in that particular section to line up along the parks and playgrounds, and it is valuable from many points of view.

Streets as play space

The child spends a great deal more time out of school than in school. The time the child is out of school is at least double the time it is in school. If we do not develop, protect and make attractive the small neighborhood places for playing, the child will play in the street, exposed to the dangers of street accidents, also exposed to moral danger, through lack of supervision, such as we have on the playgrounds. The natural tendency of such children is to gather together in small gangs and to develop the ethics of the street gang, the fundamental point, as I take it, in which is solidarity of feeling in opposition to the government, that is, in opposition to the police. That is the one prevailing point of view which you find in a gang of street boys.

As the policeman is obliged to restrict their play activities and ask them not to play ball for fear the ball will break windows, constantly suppressing some of the natural play instincts these boys have, and prevent them doing things which, if out in a lot and playground, would be the natural and right thing to do, they very soon, even the best of them, develop a feeling of resentment against the policeman, and to their minds he represents organized adult society and this fosters in the minds of the children a very dangerous and unwholesome attitude towards society in general, and a great many of them grow up with it.

That is just one point of view in regard to the moral aspects of the question. The physical side of it seems to me rather obvious. The street is no place for children to play either for safety, comfort, health, or for their moral and mental development.

It is desirable to preserve the exclusive residential character of streets so as to provide safer and healthier places for children to play until adequate space can be provided. I think there are ten children playing in the streets in Brooklyn to one playing in the playgrounds. Now, that is a very conservative statement. That is simply because our supply of playgrounds is so inadequate. The old law that no schools shall be built without a playground has not been observed. Now we have not a sufficient supply of these playgrounds. Land has become so expensive that there is no immediate prospect for years to come, of our having an adequate number of play spaces distributed through the various parks of the borough. So I believe the Commission is warranted in taking that situation into account and it cannot be answered even by saying "Well, the thing to do is to supply these playgrounds." The cost of doing that on a sufficient scale would be entirely beyond the present financial ability of the city. It would be a project comparable to the building of the subways to start out to get sufficient neighborhood spaces for play throughout the city. While we wish to get these spaces as far as we can, we shall be grateful for any wise consideration in the making of this plan which will help to make the streets where the children actually do play a little more safe than they now are, and I believe that end can be furthered by separating industrial from residence districts, and, in so far as is compatible with the convenience of the residence sections, to separate the stores also, keep them off as many blocks as conditions will warrant.

Distribution of population

I admire the work of this Commission and its report most profoundly. I think if any mistake has been made as applied to Brooklyn it has been

in the direction of too great moderation and it is unnecessary, it seems to me, to assume that with the opening up of future transit lines—all of this fan-like system spreading in every direction—it is unnecessary to assume that it will be natural to have anything like a repetition of the building development which took place up in The Bronx when that was the only line of rapid transit connecting up with the central part of the city; and I am sure that the Commission has been very moderate in its height and area restrictions so far as the Borough of Brooklyn is concerned. I believe it could safely go a little farther in that direction, and while that is not the subject directly connected with my official work, it has to do with housing conditions, to which in the past I have given quite a little attention.

Stores on residential streets objectionable

I think that a reasonable degree of separation of stores from residence districts is desirable. Take for instance, the rattling through the streets of delivery wagons. Of course, there always must be delivery service from the stores to the residential districts, but if you have stores scattered indiscriminately through the residence sections there is just that much more noise and that much more danger of accident from the traffic that has to go through those streets, and it seems to me that your Commission has shown a very great deal of discretion in trying to separate the stores from the residence districts, and yet not to put them too far away, but always have them within reach, which, of course, is important.

Statement by Clarence H. Kelsey, President, Title Guarantee & Trust Company, March 30, 1916

Need for districting

I have no doubt that the city has a right to direct future building development in accord with a well considered plan, and believe that it ought to exercise it immediately and firmly. If it does not do so, it is failing to protect itself and property values as well. Its present policy of allowing every owner of real estate to do as he pleases with his own, is a policy of self-destruction.

I do not wish to discuss the plan in detail, and I do not think the Commission should attempt to hear a vast number of property owners' individual views as influenced by the effect of the plan on their properties and attempt to reach a conclusion by reconciling these conflicting views, for the more property owners discuss the details, the more confused the situation will become. The Commission, if it is to succeed, will ultimately have to decide for itself, on broad general principles, what is best for the city's future development and adopt it without expecting to get the approval of a majority of the individual property owners. The conclusion should be based on the general good and made effectual by right of the power of the city government to do what is best for the city at large.

I have no doubt that a great many property owners will see their particular properties limited in usefulness and somewhat depreciated in value, but if the plan is not adopted, I believe there will be a far greater depreciation affecting a far greater number of people.

On values as a whole, I have no doubt of the favorable effect of this proposed control of the improvement and use of real estate. There has been a great recession in values during the last five years, and it has affected not only those who have gone counter to the new regulations sought to be

established, but those who have not; and those who may complain of the effect of these regulations on their particular properties and who think that they should be left free to build as high as they please and use as they please, may, if nothing is done, and they do anticipate their neighbors and make a greedy improvement, find a much greater loss confronting them in the future depreciation of their new buildings. I believe such depreciation is sure to come from a continuance of the present policy, and such owners will lose less by the adoption of the restrictions now proposed. These restrictions will tend to steady values and enable all real estate owners to make reasonable use of their property. This is certainly better for the city as a whole than to continue to allow a few out of many to make unfair use of their property and depress still further the value of the remaining property and ultimately their own as well.

Statement by John Kenlon, Chief of the Fire Department, May 18, 1916

Traffic congestion an obstacle to movement of fire apparatus

In the thirty years that I have been connected with the Fire Department, lower Manhattan has changed from a five-story to a twenty-five story city. There is great congestion there at the present time; during the day time it is difficult to move apparatus in response to fire calls in the lower end of Manhattan Island. Increased congestion of people and traffic in this section will cause very serious delays in getting apparatus to work around the scene of a fire. Even at present it is very difficult until the police reserves arrive and establish fire lines at a safe distance from the scene of the fire. The same condition prevails in the uptown section from 23d to 45th street, particularly at certain hours. The men who laid out the old part of the city 250 years ago had very little conception of the conditions that obtain today. Those gentlemen could not possibly see the great 10-ton and 15-ton motor trucks running around on our streets. Downtown today it is almost impossible to get through the streets. In ten years from now horses will be a very rare sight on the streets of New York. The small buggy has been superseded by the Packard, which takes four times the space. The streets are too narrow in the lower part of Manhattan to take care of the traffic. It is a serious matter; it requires a great deal of experience, a good hand and a strong arm to drive fire apparatus through the streets of lower Manhattan. Any plan that will in a measure prevent the increase of congestion in the central portions of the city, is a plan in the right direction.

Fire fighting in high buildings

We never attempt to fight fires from the street level in very high buildings, except where the fire occurs between the curb and the sixth floor. Such buildings must have the means of controlling fires from within; that is, they must be furnished with standpipes, pumps, hose, and all other auxiliary fire appliances necessary to combat a fire. From the sidewalk we can not combat a fire at a greater height than 100 feet. The Fire Department is better equipped to fight fires in the heart of the city than in the outlying sections. We have provided more powerful apparatus and stronger equipment there. But I would not use that as an argument for limiting the height of buildings. We can change our equipment to meet changing conditions, the difference being in the cost. High buildings, if

constructed along safe lines, have no terrors for me; subdivide floor areas with horizontal fireproof partitions, equip the building with an up-to-date automatic sprinkler equipment and put in smokeproof fire towers. Do that, and I care not how high you go.

Segregation of buildings will lessen fire danger

I should like to have hazardous trades, especially the storage, transportation and sale of all explosive and combustible materials segregated in different parts of the city. Segregating business of a hazardous kind would lessen the fire danger; we would not get what we call a conflagration breeder stuck in among a lot of other buildings. It would also facilitate the fighting of fire.

If you can confine stores to broad avenues and good substantial buildings, and reserve side streets for residences, there would be a great deal less danger from fire.

I think you are on the right line for the health and safety of the people in establishing residential and industrial districts. I am heartily in accord with the plan of the Commission. I have seen New York grow, and grow very rapidly. Take Harlem, for instance, north of Central Park. I remember very well when there were very few houses on that great plain. At the present time it is solidly built up, and at night is one of the most congested parts of the city.

Segregating buildings according to occupancy in different sections of the City will restrict the area in which a conflagration can occur. It will be a help to the Fire Department in laying out and equipping fire houses. I think it will greatly lessen the cost of fire protection.

Wider yards and courts would prevent fire

If we can apply to the outlying sections provisions that will prevent so great a percentage of the lot being covered by buildings, by laying out wider yards and courts, the safety of the city will be promoted. Such a plan would tend to prevent the spread of fire. Where the area of the yard is increased on both sides and the courts are larger the danger of the spread of fire is considerably less. The proposed plan requires a rear yard for every building back to back with another building. This yard must increase in width with the height of the building, being generally in Manhattan a yard of 10 feet for a five-story building and one of 20 feet for a ten-story building.

This requirement in my judgment, would, in many cases, prevent the spread of fires and make it less difficult to fight fires.

Statement by Alfred R. Kirkus, April 17, 1916

Need for districting

The slogan of "safety first" is heard on every side, except in a man's own dwelling, and there he seems to forget it. The necessity for preserving health and safety in living conditions is frequently overlooked in the struggle for dollars and cents. It is, therefore, particularly interesting to examine the magnificent work already done by the Commission on Building Districts and Restrictions, and every effort should be made to carry out, or improve upon, the comprehensive plan which they have suggested. We are so used to herding, in our travel, our business, and, alas, often in our homes, that anything that will wake us up to the value of restricting this habit and

give us light, air and safety should be welcomed and supported. There is no question that the regulations suggested by the Commission are absolutely necessary to public safety and health, and the proposed restrictions should be adopted at an early date, subject to some slight modifications.

The Borough of Manhattan has been seriously injured by the promiscuous erection of buildings. Buildings equal to four or five times the height suited to the width of the street have been built, stealing from the adjoining owners light and air, and, at the same time, destroying the light and air of that owner. It is quite apparent now that if the high building in Manhattan had been prevented several years ago, our acreage of comparatively unproductive property would have been built upon, the congestion along certain lines would have been prevented and travel distributed over broad areas, instead of concentrated into narrow ones. The plan your Commission has adopted will prevent in the future this result, and large sections will be saved from the destroying elements that have existed in the past, but the Boroughs of Brooklyn and Queens must be saved *now* from the calamities which are apparent in Manhattan.

Residing as I do in the Flatbush section of Brooklyn, and owning other property than my own residence, I am, therefore, vitally interested in the proper restricting of that most beautiful section of Greater New York. Consequently I will take up, as briefly as possible, requests for amendments to the plans of the Commission strengthening the restrictions in certain localities where I do not think they are made strong enough.

My residence is on the south side of Beverly road, within two hundred feet of a station from which within two years I shall be able to reach the centre of Manhattan in fifteen minutes for 5c, and from which I can reach the ocean front in fifteen minutes for 5c. I not only want my neighbors restricted from destroying my home, but I want to be restricted from destroying theirs. In front of me to the north is a section, Prospect Park South, that is an example of what, restricted for homes, a section can be made. Filled with beautiful detached houses, surrounded by gardens, it is unique in its close proximity to the business places of the owners. Few cities can boast of such garden spots so near to, and yet so completely detached from, the noise and turmoil of a great city. This section is restricted against apartment houses, of no matter what quality, for nine more years. Is it not utterly unreasonable that I, directly across the street, by having my property unrestricted, can erect tenements, or cliff dwellings, as I call them, facing this beautiful location; and why should I, having purchased for the purpose of maintaining a private individual house, be menaced by the possibility of those on either side of, or behind, me putting up tenements.

I would recommend that the "E" district area limits be increased slightly so that the building above the first story shall not exceed 40 per cent (instead of 30 per cent) of the area of the lot and 60 per cent on corners.

Exploitation of private home sections

The idea seems to exist that great pecuniary gains can be made by the owners of property by abandoning their homes and erecting apartments. I think this is not only a mistake but a most selfish one. My personal opinion is that lots located within fifteen minutes' travel from the centre of Manhattan will be in great demand for many, many years; that if the present houses are inadequate for the land values they can be replaced on the "E"

district plan and produce a profitable investment and a large return on the original investment. This entire section put under the "C" plan would permit of buildings, practically governed simply by the tenement house law. Rows and rows of solid buildings, occupied by hundreds of families, could be erected upon these lots and throughout the entire neighborhood, and the advantages of the property, as laid out originally, could be destroyed by one or two vandals, who, being the first, might reap a pecuniary advantage at the expense of the neighboring owners. This must be stopped and absolutely prevented *now*. We must not wait until the neighborhood has been spotted with the excrescences that have defaced certain adjacent sections already, and if a person wants to take his property and erect a multi-family house let him do it under the restriction of the amended "E" district plan, and he can still retain or enhance the value of his property, but do it in a way that will harm no one. No owner in this garden spot need be afraid of accepting this "E" district plan. It only needs a few figures and a little information to prove that property will not deteriorate by this plan. A first-class apartment house, with a fine garden and court space around it, will bring much more, permanently, than buildings with their walls abutting or with little alleyways between and no trees or gardens. All the people in New York have not yet become cliff dwellers, and anyone who has moved to this section from even a three or four-story house in the ordinary old sections of Manhattan or Brooklyn, has immediately realized the enormous benefit to health by having windows all around instead of simply front and back. How often do you find people going from these detached houses back to the old style. The move is generally to still more suburban or country life. I do not include in these those individuals who prefer to sleep in a box and spend their time in cabarets and places of amusement, because they are never home makers. I am talking now of the responsible citizen, the citizen who wants to rear and bring up properly a family of future citizens, and who takes an interest in the progress and improvement of the community generally.

A large electric sign has just been erected, through the influence of the Flatbush Chamber of Commerce, at Flatbush Avenue and Malbone Street as follows:

"This is the Entrance to Flatbush—The Garden Spot of the City of Homes."

How long will the sign mean anything if the majority of the "garden spot" can be covered with apartment houses under plan "C"?

Exception may be taken to this district plan because of the exceptional transit facilities, but these facilities are largely provided for through travel from Manhattan to the ocean front, and would not have been provided otherwise, and as industrial or factory development is not included in the Commission's plans in this section, the districting as proposed will accommodate all the population likely to inhabit same in a healthy and safe manner.

Statement by S. Adolphus Knopf, M. D., March 24, 1916

Tall buildings

A tall building, fifteen to twenty stories high, with all the modern improvements and conveniences and sufficient fire protection, situated on a public square, park or playground, which does not take away the light or air of neighboring buildings, is a monument to man's ingenuity and archi-

tectural skill. The same building, no matter how handsomely built, situated in a narrow street with buildings close to it on either side, or at the front or rear, so that those living in less high buildings are deprived of light and air, is a manifestation of man's thoughtlessness or, what is worse, selfishness and greed.

Sunlight

Sunlight and air are as essential to man's well-being as water. If I shut off water so that my neighbors cannot procure any, I should be prosecuted as a criminal, and justly so, for thus I take away what does not belong to me. In that case I should be a thief pure and simple. Yet I may construct in any narrow street as high a building as my means and the builder's skill will permit, thereby depriving a great number of my fellow-men of the light and air which are necessary to their health. In other words, I may steal from them the sunlight and air which God has given all his children, and to which all should be entitled by right of being free-born American citizens. There is as yet no law which will punish me for this crime, for that is what it is.

Deaths from tuberculosis

Tuberculosis, which is propagated by bad air, foul air and lack of sunlight, causes annually a loss of 200,000 citizens to the United States. In the City of New York during the last statistical year it was responsible for 10,000 deaths. This disease could be largely prevented if we lived and worked in pure air, in air relatively free from mineral and vegetable dust, and, last but not least, if we were to construct the buildings in which we live and labor so as to allow sunlight to enter more freely. Tuberculosis is far more prevalent among the workers in our downtown tall office buildings than is generally known and much more than should be the case when one considers the wealth which is represented there and the relatively good pay the bookkeepers and clerks receive as a rule."

Tuberculosis among garment workers

Carefully gathered statistics show that in the City of New York the garment workers are afflicted more frequently with tuberculosis than any other class of workers. The majority of these workers do not, as is often thought, work in their homes. They work in the tall crowded buildings, situated in congested districts, ten, twelve, twenty, or more stories high, where every floor masses hundreds of workers. Many are tuberculous without knowing it. Others know that they are tuberculous, but, perhaps fearing discharge, hide their disease as long as they can; but in the meantime they disseminate the germs of tuberculosis by coughing in their neighbors' faces or over the clothing they manufacture, or, what is still more frequent, spread the disease by careless expectoration on the floor. During luncheon hour they crowd the streets and avenues, and those afflicted with the disease expectorate freely on sidewalks and streets. The infectious sputum dries and pulverizes and is inhaled with the dust and causes tuberculosis in any susceptible individual who may frequent that street.

Fifth avenue

And now, not content with the many altogether too tall buildings already lining the part of Fifth Avenue south of Twenty-third Street and the adjoining streets, some (let me hope not greedy but only thoughtless) capitalists wish to increase the number of disease-breeding and death-trap sky-

scrapers and erect them in the one principal and most beautiful street of New York City, where there are as yet relatively few of these unsanitary and unsafe structures.

A second danger, although not purely medical, but which as a citizen and physician I nevertheless have the right to call attention to, is that of fire. Standpipes have not proven sufficient protection for most skyscrapers. It is for this reason no less than for the others already mentioned that the time for limiting the height of buildings in our crowded streets has come. Too many lives are sacrificed directly and indirectly through the erection of too tall buildings.

The section of Fifth Avenue between Twenty-third Street and Fifty-ninth Street is bound soon to be lined with business structures. Let these business structures be sanitary, beautiful and safe and limited in height. Let us not make a canyon of this section. It is not merely a question of beauty or aesthetics but of danger to property in the event of fire that there should be a limitation to the height of buildings, on what is left of Fifth Avenue. This limitation is an urgent necessity because it will help to diminish the danger from infectious deadly diseases and fires.

There is one more danger arising from allowing factory buildings to be located in the zone above mentioned. I refer to the danger from congestion in strikes or other labor manifestations, as was clearly shown only yesterday when there was a stoppage of all traffic for nearly an hour near 34th Street—the center of the shopping district of New York.

Statement by Nelson P. Lewis, Chief Engineer, Board of Estimate and Apportionment, May 4, 1916

Effect of high buildings on street traffic

It has seemed to me that in considering the control of the height and arrangement of buildings, their use and occupancy, consideration should be given to the effect upon street traffic of the uncontrolled and unrestricted development of the city through building operations, and the entirely uncontrolled location of industries and business.

It is obvious to anyone that in certain portions of the city, notably in lower Manhattan, the enormous day population of the office buildings, most of whom come to their work in the morning and leave in the afternoon within a very limited time, now over-taxes the public streets, and while we are reasonably free from earthquake shocks, or even tremors, you will recall that in 1884 and again in 1886 there were violent vibrations which caused a very panicky feeling. You may remember the explosion in the Tarrant Building, perhaps twenty years ago, which created a great panic in the neighborhood. It is easy to see what would happen if, in the office building district downtown, a violent explosion or earthquake tremor were to occur, which would result in a mad rush from office buildings to the streets. The panic in the streets would be almost inconceivable, and would, under existing conditions, be about as serious and fatal in its results as those which occur when people try to leave a theatre in case of an alarm of fire.

I am speaking now only of pedestrian traffic, but the vehicular traffic which will result from the over-intensive use of land in the city must also be considered.

Use districts will segregate different kinds of traffic

Perhaps there are those who might fear that the result of a segregation of heavy manufacturing, of light manufacturing and business, and of resi-

dences might aggravate present traffic conditions. I think there need be no fear on that score, whereas the greatest delays and dangers incident to public traffic are those resulting from the indiscriminate mixture of traffic of various classes. In heavy manufacturing districts we will have heavy trucking with slow movement and, if the traffic is nearly all of that class, the speed would be fairly uniform and confusion would be much less than in the case of mixed traffic. Similarly, in districts devoted to light manufacturing or business, the extraordinary development of the motor vehicle will result in greater flexibility of the traffic and its separation, to a large extent, from the very heavy traffic which will frequent the industrial districts and the pleasure traffic which will be found in the residential districts and on pleasure drives.

It appears to me that the entire problem of traffic control will be simplified rather than aggravated by such a limited degree of segregation as I think the Commission has in mind.

Effect of automobile on traffic conditions

Let me further point out that the extraordinary development of the motor vehicle which lately has taken place, while increasing the number of vehicles, may actually simplify some of the problems which might be expected to result from the segregation of business and industries.

The Secretary of State's office advises me that in the New York district, which includes not only the city, but the Counties of Nassau, Suffolk, Westchester, Rockland and Putnam, the registration for the entire year of 1915 of motor vehicles for pleasure traffic was 82,751 vehicles; for commercial uses, 13,640. That was for the twelve months ending February 1, 1916. For the first three months of the present year, from February 1st to May 1st, the registration in that district of pleasure motor vehicles was 92½ per cent of the total for the preceding twelve months, while the registration for commercial vehicles was 14 per cent greater than for the entire twelve months of the preceding year. You may think this is irrelevant, but it indicates to me very clearly that the substitution of the motor vehicle for the horse-drawn truck, through its shorter length and less occupation of street space, through its greater speed and greater flexibility, will result in a far greater capacity, and that you can dismiss as groundless any fear that the segregation of industries involving very heavy trucking, of light manufacturing or business using light commercial vehicles, or of residences, will aggravate the traffic problem. I think it will actually tend to simplify it.

The net result to the city of this simplification will be a greater traffic capacity in our existing streets, a more intelligent and economic arrangement of the streets, so far as subdivision into roadway and sidewalk is concerned and greater safety to the public using the street by avoiding in a large degree the mixed traffic which we have to-day, and which, I think, is a greater source of danger than intensive traffic of any one class.

Need for districting

While I am thoroughly convinced, not only by my own reasoning, but by what I have seen in other cities and in other countries, of the great need of some such control as the Commission proposes to recommend, I feel that if it is to be done, it should be done quickly, as there is no question but that there will be a rush to the Bureau of Buildings to get plans approved as far in advance of actual construction as possible, before any restrictive ordinance goes into effect. I fancy that if these building plans are once ap-

proved under existing ordinances, the approval will be good and valid and that you could not prevent the carrying out of building plans which have been approved by competent authorities. Consequently, the effect of a delay of many months in applying the zoning plan would be very serious and would nullify in no small degree the very purposes which your Commission has in mind. I think that the city has suffered seriously from the lack of such a plan in the past, and with the increasingly rapid growth of the city the plan becomes all the more urgent.

Meaning of garden city movement

We have heard a good deal about the garden city movement which, I think, is quite generally misunderstood. It is not so much bringing the garden into the city, or taking the city into the country, as it is a protest against further centralization. Its real purpose is decentralization and the avoidance of the aggravated conditions which we find in Manhattan Borough, and in some other parts of the city to-day, and that would be in no small degree avoided by such regulation as the Commission proposes.

Lack of districting increases cost of streets

I may say that one of the serious problems confronting my office in passing upon street plans has been the need of providing what may be an excessive width of streets where land is cheap, for fear that the building of a new transportation line, putting this land in close touch with the business centre, will result in an intensive development by apartment houses, so that we have been obliged to guard against conditions which formerly prevailed on the east side of Manhattan and to insist upon a minimum street width, which is more than the real need of the territory if reasonably restricted. If such development were confined, for instance, to two or three story houses, or in some cases to detached houses, we would not have been obliged to impose upon the property owners the cost of acquiring and then improving streets of a greater capacity than they would need, if there were some sane, reasonable plan for preventing over intensive development.

The present extension of the rapid transit system is another reason why the plan should be adopted now. It is the present extension of the rapid transit system that makes me refuse to recommend what, were it not for the danger of intensive development along these lines, would be a sufficient and reasonable street plan for a suburban development with detached houses or houses of limited height.

I think districting is a necessary concomitant or supplement to the rapid transit plan, unless the city is going to have a distorted, unbalanced growth, with strips of intensive development along the transit lines.

Development of slum areas

Within the last two decades there has been a great influx of European immigration of constantly increasing volume. The racial tendency of these people on arriving in New York is to segregate in certain quarters. This is true not only of New York, but every other industrial centre. Even though employees in mills and factories have received compensation which would really permit them to live decently, they have been disposed, in many cases, if quarters were available, to herd in a few rooms, cutting down their rental to a minimum, in order that they may within the shortest possible time save enough money to go back home. If it is possible to crowd together in tenements, they will take advantage of the opportunity.

Stores on residential streets undesirable

As I have already pointed out the greatest danger from traffic is where there is a mixed traffic—commercial and pleasure traffic—moving together along the same limited roadway at different speeds and constantly stopping.

I think that it is obvious to anyone that where there are stores in tenement quarters, stores with four or five or six stories of apartments above them, the streets become dangerous for children to play in.

Land subdivision and districting

It would be a more desirable condition if the ordinary house could be put on a lot more nearly square, so that it would have light on all sides. I would like to give you an illustration showing an alternative method of subdivision of an indentical area in the Borough of Brooklyn. A triangular tract of twenty-odd acres, bounded on all three sides by wide streets, is now subdivided in the conventional fashion by streets sixty and eighty feet wide, and has been evidently designed for detached houses on plots containing two units, that is, plots forty feet wide by one hundred feet in depth. The alternative subdivision is for streets forty and fifty feet in width, with lots sixty feet in depth and fifty feet wide. A little neighborhood park is set aside for the use of the residents and there is a larger number of the fifty by sixty foot plots. The result is to decrease the cost of each plot, notwithstanding the greater expenditure for sewers, by reason of the greater length of streets, the greater expenditure for curbing, and for sidewalks, but a much reduced cost of pavement, owing to narrower roadways, the result being that the plots themselves, with all improvements, cost appreciably less than in the case of the forty by one hundred foot units.

At the last annual convention of the National City Planning Conference the general feeling was that under existing conditions the best typical lot unit was twenty-five by one hundred feet, because allowance had to be made for convertibility at any time to business or industrial use. Lots fifty by sixty feet are not as readily convertible to business or industry as lots twenty-five by one hundred. This, in my judgment, proves the necessity for districting the city in order to obtain an ideal street and block layout for residential use.

This city has suffered tremendous loses by the inflexibility of its street system which, instead of controlling a subdivision, has been controlled by the habit of creating lots one hundred feet deep, lying between streets two hundred feet apart, and great enterprises, a number of which were formerly located at the Erie Basin section of Brooklyn, finding themselves hemmed in by rigid street systems, to which more or less sanctity was attributed, have been obliged to find new sites on the New Jersey meadows. One conspicuous instance of this is the Worthington Pumps Works. The city has suffered materially by compelling a large number of factories to go into other States in order to secure adequate sites.

Height limit should be more drastic

I cannot speak for those whose chief interest is the value of real estate, but I believe that the man who wants to maintain a house in a certain district would welcome the one times street width limitation and feel that the ordinary street width, which we will call sixty feet and in some cases eighty feet, would permit as tall a building as he wants to see in his neighborhood, and in a great many cases—I am speaking now of my own personal preference—he would like to see a height limit of the street width less fifteen or twenty per cent. In other words, I believe there are many people who will

express the wish that the Commission had gone even further in its limitation than is proposed.

Undoubtedly, a comprehensive transportation system could be more intelligently planned if those responsible for planning it knew in advance what kind of development would be possible in the various districts through which it would pass.

Sensational building along subway

I remember the sensational development of the Washington Heights district on the completion of the present subway. It came very suddenly, and you will see the same thing happen in Corona in a very few months, in a district nearer in time and distance to the center of Manhattan and where, in deference to the persistent demands of property owners to save the expense of widening some streets which were originally laid out at fifty feet, those old widths have been maintained, and unless there is some restriction upon the kind of development which can occur, I think we will have a serious problem for the city to deal with in that district.

Sewerage

This sudden and unusual growth of apartment houses and tenement houses has severely taxed the sewer system of the city. They have made it quite obvious that steps have got to be taken to protect the harbor and the rest of the city from being fouled by this sewage, although when we talk about taxing the existing sewer system, I think that as a hydraulic problem it is very much exaggerated, as we are still providing sewers to accommodate both surface water and house drainage, and the amount of house sewage is almost negligible in comparison with the surface water for which provisions must be made. Large sections directly along the new lines of the dual rapid transit system are as yet unsewered. There would be an extensive development of tenement houses in a number of these sections were it not that the tenement house law prohibits the occupancy of a tenement house unless it has a sewer connection. There are a number of tenement houses in Queens to-day which cannot get occupancy permits because there are no sewers to connect with.

The sewage problem is greatly intensified where the only system is a sanitary system. By that I mean that the sanitary system does not permit even of a connection of a yard and a roof of any building with the sanitary sewer without danger of surcharging the sewers yet the Tenement House Law requires that all courts, yards and roofs shall be connected with the sewer. In many cases the only sewer in the street is a sanitary sewer, and to connect the roofs and yards and courts with it would surcharge it, causing a backing up into other houses.

Districting a protection against fire

After a study of the great city fires and conflagrations, like the Baltimore fire, the Chicago fire, the Salem fire and the San Francisco earthquake and fire, I think it is manifest that the segregation of industrial buildings should be had in the City of New York, purely from a fire fighting point of view.

Effect of districting on land values

In my judgment, the adoption of this plan, while it might check sensational increases of value in certain districts, will undoubtedly result in a greater total tax value, far better diffused than has heretofore been the case.

STATEMENT BY SAM A. LEWISOHN, OF ADOLPH LEWISOHN & SONS, MARCH 24, 1916

Need for districting

Many of us who have been giving our attention to municipal matters have regarded the work of your Commission in providing for height and use zones for the city as probably the most important piece of constructive work for the city's progress that has been carried out in the last decade. The districting plan as I understand it is merely a provision for "enforced co-operation." Anyone, like myself, who has followed real estate for even a short number of years realizes what a fundamental need the districting plan is, both as it applies to the heights and cubage of buildings and to the use for which the building is to be built, and how we have suffered in the past for the lack of such a plan. Irretrievable harm has indeed been done not only to the health and comfort of the community, but to real estate values themselves by the absence of such a system as is contemplated. Well recognized examples are the useless deterioration of certain parts of the city by erratic changes in use, the building up of skyscrapers to shut out each others' light and air, and the invasion of residential districts by skyscrapers on the one hand and by undesirable commercial establishments on the other.

STATEMENT BY SAM A. LEWISOHN, OF ADOLPH LEWISOHN & SONS, MAY 1, 1916

Restrictions too liberal

I have personally been very much interested in the work of your Commission, and was very glad indeed to write you expressing my belief that the work you are doing is as important a piece of work as has been carried forward in this city for the past decade. Upon studying your tentative plans, however, much as I have been impressed by the devotion and thoroughness with which you have approached this difficult task, still I feel, as do many others, much disappointed over the fact that the liberality of your allowance on height and area is such as to render it doubtful whether the hoped for results will be obtained.

I have read with interest the memorandum submitted to you by the Committee on City Planning of the City Club of New York. I fully concur with most of the suggestions contained therein, particularly with reference to the stricter provisions for districts other than Manhattan, especially the Brooklyn and Queens districts, which are still to be developed. As one who is interested in property in such districts, particularly in the outlying districts of Queens, I can assure you that in the end real estate holders will welcome provisions that will force a type of building which will have a slighter resemblance to the old type tenement; in other words, the substitution of D districts for most of the B and C districts and the establishment in a large part of the borough of districts more restricted than are D districts. Once the temptation to follow in the rut of the old-fashioned tenement is removed, the landlord will reap the benefit in the larger rents which will accrue in a district developed in the more enlightened way. From my study of the tentative report of your Committee I fear greatly that even the D provisions will permit a type of building that will differ but very slightly from certain types of tenements already objectionable. Many of us who look to the outlying districts for developing an improved and more enlightened type of dwelling for the less wealthy members of our community feel that such a result would be a calamity, particularly as once such a type of dwelling is established it will be impossible to change the regulations, and

we will have the conditions as at present existing in some of our congested districts, or certainly only a very small improvement.

Too liberal restrictions penalize better developments

By not having strict enough regulations you are penalizing the landlord that would attempt to use his ingenuity to develop an enlightened type of dwelling; in fact, it is almost impossible to attempt any schemes in this direction unless the surrounding district is protected. On the other hand, if there is adequate protection the ingenuity of the builders will be taxed to provide an adequate building within the regulations enforced. I do not believe, therefore, that your Commission should hesitate through any fear of supposed opposition on the part of real estate owners—an opposition which I do not believe will be encountered—to provide an adequate regulation.

I hope you will understand the spirit in which the above suggestions are made. I have only been impelled to make them because of the enormous significance the regulations adopted by your Commission will have upon the future of New York City.

STATEMENT BY FRANK LORD, VICE-PRESIDENT, CROSS & BROWN COMPANY, REAL ESTATE AND INSURANCE, MARCH 29, 1916

Condition of real estate

After an experience of 41 years in New York business real estate, I cannot remember a time since 1875 when the plan of restricting heights and limiting areas would have caused less disturbance to real estate values than now. Values have been greatly reduced and activity almost suspended in the districts below Chambers Street, where high building and light monopolizing has been most prevalent. In the districts where activity and stable values have prevailed above 34th Street, high buildings have until recently been considered unnecessary and will work great harm if one or two buildings of the superdreadnought type are constructed to appropriate and concentrate in one or two spots the business activity which should be spread over a reasonable area and impart benefit to a large section.

In the midtown section of the mercantile district, say from Canal Street to 23d Street, where there has been almost complete prostration, the restriction of the height of buildings can work no possible harm and may encourage the construction of eight to ten story buildings, with all Labor Law requirements that will command reasonable rents. This district will then gradually regain its lost character and in a measure its activity and value as a manufacturing center will be re-established.

New York has had a high building debauch and I believe has learned that there is some analogy in after-effects between high buildings and low vitality in inverse ratio. It is too much to expect that building restrictions will create value, but it is fair to believe that the reasonable restrictions proposed by the Commission on Building Districts and Restrictions will conserve value and stabilize districts.

Present appropriate time for districting

The permanent location of two great railway terminals at 33d Street and at 42d Street, the building of the Broadway or Central Subway, the Seventh Avenue or west side subway on Seventh Avenue, and the Lexington Avenue or east side subway, mark this time as the most appropriate in the

recent history of New York to inaugurate this great plan and to plan with certainty a specific kind of building for a given locality without incurring the danger of having the value of the improvement partly or wholly destroyed by improper uses of adjoining or neighboring premises. I believe that the adoption of the proposed plan of restricting and limiting the height of buildings will attract a large amount of capital to build better homes in better localities and appropriate buildings in appropriate localities, that will be to the advantage of the entire city both in healthfulness and permanent values, and to help prevent the congestion of New York streets both through concentrated shipping and the gathering of operatives at certain hours of the day.

New York has prospered under apartment house building restrictions; no one complains, everybody is satisfied. Why should not business districts enjoy the same measure of protection that has been gained through the wise provisions of the apartment house law? Those who have had the welfare of New York at heart have recognized for the past twenty years the necessity of some form of control over business buildings and for the protection of business and residence localities; and the work of the Commission on Building Districts and Restrictions is but a tardy response to the urgent need for action, and in my opinion it would be a grievous loss to this city if the work of this Commission should be lost through failure to recognize its value to the entire city.

New York is at present at a disadvantage in that investors are running great risks in erecting almost any kind of a building while the city is left in its present haphazard condition and at the risk of having either its residence population or business houses driven out of certain districts through uncontrolled action of speculative builders and inconsiderate owners.

High buildings make tremendous demand on the city's service and resources; they overtax its narrow streets and the land which carried two or three superimposed buildings pays no more land tax than the modest four or eight-story building.

Statement by Dr. Marion B. McMillan, Assistant Sanitary Superintendent, Department of Health, March 30, 1916

Sanitary condition of office buildings

I had the pleasure of conducting during the last four months an investigation leading toward the establishment of better sanitary conditions in the office buildings located in the financial district. I shall give a short summary of data I obtained in a trial block between Broadway, Nassau Street, Cedar Street and Liberty Street.

In looking over the block we have taken into account 928 office rooms, in which the total number of employees was 2,380 people. The percentage of individuals working eight hours and over in this district was 92.71 per cent, and the number under eight hours was 7.29 per cent. Of the 2,382 individuals working there, over 92 per cent worked eight hours and over, a day. The per cent of the entire number provided with natural light was 14.67. 85.33 were subjected to artificial light. In going over the point of public health and the relation of the office worker to public health under present conditions, in our large financial districts, we found that the individuals who are most affected are the clerks and stenographers; individuals with low salaries. It is among this class of individuals that the Department of Health finds the heaviest per cent of tuberculosis and it is in this class of individuals where the case incidence of disease per year is highest.

Artificial illumination in office buildings

There is a direct relationship between the growth of bacteria and the quantity of light. The conditions on Cedar Street have changed greatly since the construction of the Equitable Building, this building cutting off 75 per cent of the natural light from the north side of the street. This makes it necessary for the individuals in these offices to use artificial light practically every working day in the year.

In looking over the direct injuries resulting to workers from the use of artificial light I found that a very large per cent of them are suffering at the present time from eye strain to a marked degree. In some instances it had generated nervous and hyper-nervous conditions, symptoms especially manifest in the afternoon, between the hours of four and five o'clock. The lack of light was just as demonstrable as the use of too much light. This was especially the case where electrical installations had been badly placed. I have discussed this subject with many physicians of the city and that is their general opinion too. I have conferred with them especially with regard to light, and they have stated to me that the number of cases of eye strain with the resulting use of glasses in the City of New York, has increased in the last five years almost 30 per cent and in some instances even as high as 50 per cent.

It is possible by artificial means to approximate conditions of day light in office buildings, but whether it is commercially possible I do not know. It seems to me it is commercially impossible at present. I know there is a glass which cuts off approximately 85 per cent of the artificial light, but the quality of the light when finally discharged approximates daylight very closely. From the point of view of eye strain natural light is better than artificial light.

The experience of most physicians with regard to the use of artificial illumination has been that little, if any, approaches the actual composition of daylight. The newer lights, such as the tungsten and the nitrogen light, are so intense in their rays that it is with difficulty that they are used without really producing too much light. Now these rays have got to be modified and diffused in such a way as to do away with the eye strain which follows their use. Perhaps it is only a slight fancy on my part, but I believe that some day, looking into the future, we will see that individuals who work all the time under artificial light will gradually develop adaptability to that kind of light at the cost of their adaptability to day light.

I base this belief on the fact that employees in our factories manufacturing electric globes sit there and standardize globes continuously during the first week, and suffer much from intense inflammation of the retina, the interior portion of the eye, but that gradually goes away and the individual accustoms himself to the new conditions.

In natural light we understand the invisible rays to be the most active, both chemically and bacteriologically. In artificial light we only have a small per cent of these entering into its composition, and sometimes none at all. On this account the bacteriocidal effect of artificial light is practically nil.

I found in one instance in one of our large banking houses, individual efficiency was increased 25 per cent by changing the system of lighting and the quality and kind of light. This was admitted to me by the office manager himself. This was in the adding machine department.

Ventilation of office buildings

The point that the Department of Health wishes to make before this Commission is that it is detrimental to health to have an unlimited height of office buildings, and to have large buildings in close proximity to each other, not only on account of the lighting problem but also as regards the free access of air, unless artificial, mechanical ventilation is used. As a matter of fact when I was in one of the most advanced sanitary bank buildings that I could find in that district, I found forced ventilation employed only on the first and second floors. Most of the building was provided with natural ventilation. People in these office buildings often do not use natural ventilation on account of the fact that they complain of suffering from colds and draughts. Failure to use natural ventilation is particularly noticeable where air shafts exist.

Floor space per office employee

The number of square feet of floor space per employee in this block was as follows:

From 5 to 50 square feet per person.....	26%
From 51 to 71 square feet per person.....	22%
From 76 to 100 square feet per person.....	24%
From 101 to 150 square feet per person.....	16%
From 151 to 200 square feet per person.....	8%
Over 200 square feet.	

Need for districting

Not only do I think it advisable, but I think it is a question of actual necessity as regards the enforcement of the public health laws in the City of New York, that restrictions of the character proposed by this Commission should be enacted and clearly defined.

High morbidity rate in offices

I find a more than normal per cent of case incidence in office workers who are confined to poorly ventilated and ill lighted offices. The case incidence in New York of disease we roughly estimate to be 2.82 per cent, that is from all diseases. In some of our office buildings downtown I found, in going over the investigations made, case incidences running up as high as 9.68 per cent which would indicate something which was not normal compared with the rest of the city.

Tuberculosis has been particularly prevalent in the office buildings. Eye strain and diseases of the nose and throat, catarrh, colds, etc., are also very prevalent. Absence due to sickness runs from .32 per cent to as high as 9.68 per cent—it varies between these figures.

Humidity of office buildings

In offices we find low humidity—very low humidity as compared with the outside—sometimes a change of 40 per cent from the atmospheric humidity. There is a very marked difference in the humidity in rooms inhabited by one person or in which one person is continuously working and one where a number of persons work. The humidity increases in direct proportion to the number of people in the room.

Humidity, ordinarily speaking, is not of importance from the point of view of health until we have high temperature linked with humidity, and then the question of ventilation becomes very important. Reduction of the temperature on the surface of the body naturally is important. I think

we lose sight of one point when it comes to respiratory troubles. Where the necessary humidity is taken out of the atmosphere there follows a congestion of the mucous membrane of the nasal passages due to the continuous breathing of dry hot air. When an individual is subjected to a change of temperature of from 25 to 30 degrees by going from his house into the street, coupled with a change in the humidity of over 20 per cent, an inflammatory reaction follows. It is due to this, I think, that we suffer a great deal in New York City, from catarrhal conditions.

Statement by Benjamin C. Marsh, Secretary of the New York Congestion Committee, April 27, 1916

The Commission on Building Districts and Restrictions has made the most painstaking and careful study of existing conditions of development, use and future needs of New York City, ever made in this country, and probably in the world.

The principles of your report must commend themselves universally, the districting of the city to prevent the construction of as high buildings in the outlying boroughs, as have injured Manhattan, and the restriction of districts against industry.

It seems to us, however, that these restrictions can be applied more fully than you have done. We submit, therefore, the following suggestions:

Limitations on the Size of Buildings Should Be More Drastic

Very few tenements (except high class apartment houses) will have elevators, unless they are over five stories high. It is undesirable to require any family to climb over three flights of stairs, above the first floor; although five-story tenements are permitted, under the tentative plans of the Commission, in The Bronx and Queens up to the City Line, throughout Brooklyn and in almost all of Richmond. It would be wiser to increase the acreage that is entirely restricted, to lower the heights of buildings used for residential purposes, to increase the area restricted to one and two-family houses, and to permit more intensive use of land in unrestricted areas for business and industrial purposes than for residential purposes.

Height limitation alone, in relation to street width, is not adequate, because the width of streets varies greatly within the same height districts.

The maximum number of stories for each height district should be established, in addition to the height limitation, with a sliding scale permitting an additional story for every additional 10 per cent of the lot area left unoccupied above the requirement for the district.

To equalize conditions of specially intensive development, a regulation might be adopted that when 50 or more per cent of the frontage of a block is more intensively developed than the regulations permit, the rest of the block may be similarly developed.

Suggestions Regarding Number of Stories and Heights

Manhattan

No building should be permitted to exceed in height one and three-quarters times the width of the street, with a maximum of sixteen stories, except in the area in the center of the lower end of the island, where the Commission recommends a height of two and a half times the width of the street. The area along the water front, where the Commission recom-

mends a height of twice the width of the street, should be limited to one and a half times the width.

In the northern part of the island, at least north of 156th Street—if possible, north of 126th Street—the height should be limited to once and a quarter times the width of the street.

The Bronx

The area in which the Commission recommends twice the width of the street should be limited to one and a half times the width.

The area north of this strip along the waterfront up to 177th Street and Tremont Avenue, from the Ship Canal to Bronx Park, should be limited to one and a quarter times the width of the street, with a maximum of five stories, west of the Bronx River.

The area bounded by 177th Street, Tremont Avenue, Bronx Park, Fordham Road, Webster Avenue, 200th Street, Jerome Avenue, Kingsbridge Road and Spuyten Duyvil, the area south of the Bronx and Pelham Parkway, east of the Bronx River and a block each side of Broadway from Spuyten Duyvil to City Line should be restricted to once the width of the street, with a maximum of four stories.

The rest of the borough should be limited to once the width of the street, with a maximum of three stories.

Brooklyn

The maximum height in Brooklyn should be one and a half times the width of the street. This should be permitted only along the waterfront.

The Brooklyn Heights section, Eastern Parkway, Court Street and the main business streets should be restricted to a height of one and a quarter times the width of the street, with a maximum of nine stories.

The rest of the borough should be restricted to once the width of the street, with a maximum of four stories in Greenpoint, Williamsburg, South Brooklyn to Sunset Park, and the northern part of Brownsville, and three stories in the rest of the borough. Areas not near industrial districts, where the predominating value of land is less than $5.00 per front foot, should be restricted to single or two-family houses.

Queens

The waterfront area, for which the Commission recommends a height twice the width of the street, should be restricted to one and a half times the width.

The rest of Long Island City and the main business streets of old Flushing and Jamaica should be restricted to a height of one and a quarter times the width of the street, with a maximum of five stories.

The remainder of the borough should be restricted to once the width of the street, with a maximum of three stories, and with the same restrictions to one or two-family houses as suggested for Brooklyn.

Richmond

This borough should be limited to one and a quarter times the width of the street, with a maximum—along the northern and eastern shores—of four stories, and in the rest of the borough of three stories, with the same restrictions to one and two-family houses as suggested for Brooklyn and Queens.

Area Restrictions Recommended

In areas designated B, by the Commission, only 65 per cent of the area of interior lots should be occupied, and 85 per cent of the area of

corner lots; for C districts the areas should be respectively 60 per cent and 80 per cent; for D districts 55 per cent and 75 per cent, and for E districts the number of families should be limited to fifteen per acre.

These suggestions may seem severe for outlying boroughs, but except in rare instances they will not affect existing land values materially, nor do they involve as much restriction as the limitations proposed by the Commission for lower Manhattan.

Areas adjacent to existing parks, and playgrounds should be restricted

As the City cannot at present make ideal provision of parks and playgrounds, the areas adjacent to existing ones should be restricted against industry.

New district needed

A new district or type of restriction should be adopted against industry of any kind, *i. e.*, excluding the use of two stories, or 25 per cent of the floor area for manufacture, but permitting retail stores.

Areas which should be restricted against industry

In every borough a much larger area should be restricted against industry. In general, no large area should be unrestricted in a district now chiefly, or even largely, tenement. In established and developed areas, few blocks should be unrestricted in which there are at present less than five hundred workers in factories.

Manhattan

Seventh Avenue, south of 13th Street, should be restricted, also many more blocks and side streets, in Greenwich Village, on the lower East Side and on both sides of the borough to 34th Street, except a few blocks back from the waterfront.

The Bronx

The unrestricted area along the waterfront should be narrowed to not over half to three-quarters of a mile, especially along the East River from the New York, New Haven and Hartford Railroad to the Sound and on Eastchester Creek.

Brooklyn

In Greenpoint the residential district should be extended north to Dupont Street, between Franklin and Oakland Streets.

In Williamsburg a larger area should be restricted and the unrestricted area along the waterfront should be narrowed.

A large part of the Red Hook District should be restricted.

The area around Jamaica Bay now "undetermined" should be definitely restricted.

More of the area bounded by Grand Street, Flushing, Nostrand and Lexington Avenues should be restricted; also more of Brownsville.

Queens

Much more of Long Island City should be restricted; the unrestricted area along the East River and Newtown and Flushing creeks should be narrowed.

The area around Jamaica Bay, now "undetermined," should be definitely restricted. The unrestricted area, east of Flushing Bay, should be reduced.

Richmond

The area "undetermined" should be definitely restricted, and the unrestricted area on the waterfront should be narrowed.

Statement by Henry Moskowitz, President, Municipal Civil Service Commission, May 25, 1916

Exits in factory loft buildings

I have had experience as Secretary of the Joint Board of Sanitary Control, which makes semi-annual inspections in the cloak and suit industry and the dress and waist industry.

The number of operatives in the busy season for the two industries, I should say, is fifty thousand for the cloak and suit industry and thirty-five thousand for the dress and waist industry, making a total of eighty-five thousand operatives.

The effect of congested factory conditions among the high loft buildings is bad for a number of reasons. One of the chief difficulties in these loft buildings is the inadequate elevator accommodations. As a consequence the girls are compelled to go up on the freight elevators in the back of the building during the rush hours. It is very difficult to provide adequate safety from fire in these buildings without a fire wall. This at least the majority of them do not have. They simply have stairs and fire escapes for exits. In general I think that the average factory loft building is unsafe above the eighth floor. In case of a fire, the exit facilities would be inadequate.

In certain buildings employers have refused to order fire drills on account of the danger attached to possible panic and also the danger of actually walking down the stairs.

The present form of fire escape is not only dangerous but it is difficult to handle, especially in those factories where girls are working. The girls are more nervous and more liable to become panic stricken than men. Then the fire escape is very inadequate.

The fireproof enclosed stairways, the fire towers, and even the so-called smokeproof towers, in my judgment, are less smokeproof than advertised. We have found in a great many cases that what was deemed an adequate exit in case of fire proved inadequate under special circumstances. I long ago came to the conclusion that we shall never have adequate safety from fire unless we have a fire wall or some arrangement on the principle of a fire wall.

I haven't found any fireproof building I could call reasonably safe.

Lunch facilities in loft buildings

The lunch service for these factory workers is not adequate from a health standpoint. In some of the newer buildings there are provisions for lunch rooms. But that depends upon the good will and the point of view of the manufacturer. The rents are very high and they want to use the maximum space. As a consequence the girls have in many factories inadequate lunch rooms, so they eat their lunches at their machines, among the garments that they are sewing. As a result they sometimes make grease spots on the new garments. One of the frequent causes of dispute between employer and worker is that the girl has made grease spots on the garments while eating her lunch.

Such public restaurants as may be found in the locality are so jammed

at noon that a satisfactory luncheon is impossible. But that applies also to the people who work downtown in the overcrowded business buildings.

Lower East Side

The congestion of the East Side was created by the needle work industry. If the garment factories were not located on the east side or near the east side of Manhattan, the East Side as a neighborhood for working people would not exist. The condition of the East Side with reference to congestion is particularly the result of a lack of a City Plan. If thirty years ago the area of the City of New York had been laid out into zones much of this tenement legislation and much of the work that reformers have had to do because of congestion would have been unnecessary.

Districting will prevent a duplication of the evils of congestion in the newer sections of the city. The areas near the new rapid transit roads in Queens ought to be saved from the fate of the lower east side. Sections in the Bronx ought also to be saved. You can save them yet.

Tenement house manufacturing

Manufacturing in tenements is harmful to every resident of the tenement. I consider it harmful to the operatives. I consider it harmful to the purchaser of goods, because the regulation of contagious diseases in tenement houses is bound to be inadequate, and I think that tenement house labor ought to be absolutely abolished. I say this with regard to all kinds of manufacturing in tenements because you cannot regulate the sanitary conditions of tenements and you cannot regulate danger from contagion. I think it is better, especially for the people that have to work, that they work in factories rather than in tenement homes.

Statement by John J. Murphy, Commissioner, Tenement House Department, May 9, 1916

Results accomplished by Tenement House Law

My duties as Commissioner have brought me into close contact with existing conditions in the City of New York. I have studied all the types of old tenement houses erected before the passage of the present law and some which were erected when there was no law on the statute books affecting tenement houses. When I first came to New York to live thirty-four years ago I lived in a district which, while having formerly been a residential district, was at that time used for tenement house purposes in fact. I may, therefore, say that both by personal experience and official opportunity I can speak on the subject as one who has reached certain definite conclusions. There can be no question that the provisions of the law providing for limitations on the height of non-fireproof buildings, the provision of such yard and court spaces as the law now requires for providing light and ventilation to interior rooms, the control of sanitary arrangements of multiple dwellings, and the requirement of adequate means of fire escape have greatly added to the welfare, safety, and longevity of dwellers in congested districts.

Observation of the enforcement of the law has developed the fact that more stringent requirements would have accomplished more, but it seems that, at the time the law was passed, in view of then existing conditions, these requirements were all that could be enforced.

The tenement house law represents after all the minimum which the people who were working for better public sanitation would accept and the maximum that they were able to obtain.

Districting a benefit to health

I am of the opinion that any reasonable regulation tending to increase open spaces will inevitably tend to the production of more healthful conditions. I believe that the elimination of factories from tenement districts will be helpful, especially if the regulation prevents the existence of factories in tenement houses. Experience has shown me that the use of tenement houses for business or manufacturing purposes, above the ground floor, is injurious to the health and morals of the occupants.

Exit facilities in tenements

The width of stairways and the capacity of fire-escapes and fire passages in tenement houses was based upon the presumption that the building will be occupied by not more than the normal family occupancy of such a building, and to create a condition in which the exit facilities would be called upon to serve more than that number of people in an emergency would be likely to create dangerous conditions.

Business and industry are now allowed above the ground floor in tenement houses. Factories are permitted under regulations of the State Industrial Commission. Businesses are regulated as to their hazardousness by the city ordinances and the Tenement House Department, when it finds that any business is installed in a tenement house, above the ground floor, places extra requirements in the matter of exits, but, in view of the fact that to provide any new exits would call almost for a reconstruction of the lower parts of certain buildings, the means of exits now resorted to are frequently below standard.

Height of tenements

The limitations on buildings require them to be fireproof, if over six stories in height. This establishes a sort of automatic check on the height of tenements. There has been no tendency noticeable in Brooklyn outside of Williamsburgh for the four-story house to develop into the six-story house. There has been very little tendency in The Bronx for five-story houses, with which they practically started to build tenements up there, to develop into six stories. It seems as if certain types have imposed these conditions. The extra climb in non-elevator apartments makes it very difficult to reach the sixth floor, and so they have not put them in in certain sections. Of course, there has been a certain tendency for fireproof buildings to go higher and higher. I think there again the 150-foot limitation served as a check. That was imposed by a regulation of the Bureau of Buildings and not by ourselves, except as far as the check afforded by the width of the street was concerned—that, of course, we have in operation.

Disastrous effects of haphazard development

It is a fact that in many instances the splendid results, flowing from the enforcement of the Tenement House Law as to light and ventilation, are interfered with and in some instances almost frustrated by the erection of adjacent buildings used for other purposes. I would supplement that statement by saying that one of the things that the law sought to secure as much as possible was interior block ventilation and that purpose is often frustrated by the erection of buildings which are unrestricted as to depth under present conditions running through blocks.

Many of the things that are prohibited by Section 39 of the Tenement House Law in tenement houses or on the same lot with tenements are frequently found upon adjacent lots and in adjacent houses. Under such circumstances the damage to the occupants of the tenement houses is nearly as great as if there were no tenement house law. The prohibition of the storage of excelsior, straw, hay, and other combustible material in tenement houses which are considered sources of fire or conflagrations is only half effective by reason of the fact that our housing reform measures have not been co-ordinated and have not had the support of kindred laws governing other kinds of buildings in the city of New York.

Deaths in tenement house fires

There have been many lives lost in tenements since the passage of the Tenement House Law. In all of these cases, possibly with one or two exceptions, the buildings were equipped with exits and fire escapes and other fire prevention equipment, as required by the Tenement House Law. The fatalities have come in spite of the provisions of the law. I would charge a large proportion of this loss of life up to panicky conditions that have obtained among people who live in these houses.

I think the experience of other cities, Chicago, for example, indicate that no loss of life need be feared in tenement houses that are not more than three stories in height. We have had one bad case of loss of life in a three-story building in Williamsburg due to suffocation. The people had not awakened and the smoke filtered in through cracks in the floor and suffocated people in their beds, but with this exception, and with the provisions of the means of fire escapes, which the law now requires it would be almost certain that we would have no loss of life by fire in tenement houses.

Our universal experience is that people are usually suffocated rather than burned to death in tenement house fires. It may fairly be said that the greatest proportion of the loss of life in tenement house fires has been due to suffocation, panic and ignorance as to the means of escape provided. If I should be asked what I thought was the most serious factor in the loss of life by fire in tenement houses I would say it was ignorance of how to use the means of escape actually provided.

Size of outer courts

In some sections of the City, I feel that it is desirable to increase the requirements of the Tenement House Law as to courts, yards, and open spaces and to decrease the height of buildings allowed under the Tenement House Law. This is desirable in the interest of public health, safety and general welfare. In the new law tenements, the undesirability of the light and ventilation in rear apartments is fairly indicated by the reduced rentals that they bring.

An outer court on the lot line, six and one-half feet wide and sixty-five to seventy feet long, as allowed under the Tenement House Law in a six story building does not adequately light the lower rooms facing on the court, neither does a nineteen-foot rear yard and a nine and one-half foot outer court on the lot line adequately light the lower stories of a twelve-story apartment house.

The present provision of the Tenement House Law allowing the length of an outer court to be ten to twelve times its width, does not admit adequate lighting in that portion of the court which is nearest the closed end. The maximum length of an outer court should not exceed eight times its width if proper allowance is to be made for light and ventilation.

Statement by W. A. Murrill, Assistant Director, New York Botanical Garden, Bronx Park, April 15, 1916

Factories injure vegetation

Botanical gardens should be zealously guarded against conditions that factories will most certainly bring. Most of the botanical gardens in Europe have suffered from such conditions and have had to move to the suburbs of cities. The New York Botanical Garden was located in its present position to avoid such conditions and it would seem a pity to impose them upon it now.

Many of the rare and beautiful plants grown in botanical gardens are extremely sensitive to gases from factories. The fir trees and their relatives are particularly sensitive to smoke and dust. Botanical gardens must depend largely upon the character of the people in its immediate neighborhood for the protection of its plants. The beauty and usefulness of botanical gardens, as well as of parks, are not enhanced by ugly buildings and the unfavorable conditions surrounding factories.

Statement by Frederic B. Pratt, Chairman Brooklyn Committee on City Plan, March 27, 1916

General approval of Commission's report

The Executive Committee of the Brooklyn Committee on City Plan has examined with care and with great interest the tentative report of the Commission and has studied the maps proposing districts and restrictions prepared by your experts.

The Brooklyn Committee desires to congratulate the Commission on the approaching completion of so valuable a piece of work. It is evident to all who have studied the report, plans and proposed resolutions, that the work of the experts has been painstaking to an unusual degree, involving close consideration of the existing conditions and prospective development of individual blocks as well as of districts.

Brooklyn's inadequate park system

In seeking to formulate plans and regulations which might apply equally to districts in the different boroughs at equivalent distances from the business center of Manhattan, we feel, however, and venture to suggest, that the peculiar needs of Brooklyn and the desires of Brooklyn people have been to some extent subordinated to a general plan.

For instance, the Bronx is already provided with a magnificent system of parks. Brooklyn is not at all equally favored, and it is self-evident that no equal system of open spaces can be provided in Brooklyn at equal distances from the business center of Manhattan. It seems to us to follow from this that much stricter building regulations should be imposed on Brooklyn territory, so that the open spaces which cannot be provided in large areas may be secured in a measure through closer restrictions on the amount of land to be covered by buildings.

More stringent restrictions desired for Brooklyn

We believe, moreover, that it is the general desire of the people of Brooklyn that the borough should never attain to the congestion which is found in Manhattan, but we notice on the map of tentative area districts that it is proposed to permit the same dimensions for residential buildings which are deemed proper for the greater part of Manhattan, to extend in Brook-

lyn from the Heights to and a little beyond Prospect Park on the south and Throop and Bushwick Avenues on the east, while the still larger C Districts, extending eastward to Forest Park and beyond it southward over most of the area to Bay Ridge and Sheepshead Bay, are scarcely less restricted.

The difference between the restrictions in the B districts and the C districts is so small, not beginning, in fact, to take effect for buildings less than 60 feet in height, that the Brooklyn Committee recommends to the Commission that all of the B districts should be made C districts, excepting perhaps a few small areas on the Heights, the Park Slope and the Hill. In the judgment of the Brooklyn Committee no injustice would be done if the borders of the C districts were extended to include all of the B districts.

It is likewise the thought of the Brooklyn Committee that the limits of the D districts should be extended from the fringe of the borough toward its center by considerable extensions. In the D districts only 60 per cent of the lot may be covered by tenement or apartment houses; while in A, B and C districts 70 per cent may be covered. Also in the D districts the yard must be at least 21 feet in depth for a building 50 feet in height, while in the A and B districts it need be but 15 feet in depth for a building 90 feet in height, and in the C districts 18 feet 9 inches for a building 90 feet in height.

For similar reasons we would urge an extension of the E districts, with their still closer restrictions.

We believe not only for reasons already mentioned that closer restrictions should be applied to Brooklyn than to Manhattan or the Bronx, but that the value of Brooklyn territory in the aggregate will be greater with such restrictions than without them; and, further, that such restrictions will tend to elevate the level of citizenship throughout the wide extent of this rapidly growing borough, which is destined for many years to come to be an increasing factor in determining the future destiny of the Great Metropolis.

Yards of non-residential buildings should extend to the ground level

Regarding non-residential buildings in residential districts, we observe that such buildings are permitted to cover the whole of the lot area in the B and C districts to a height of 18 feet above the curb. This seems to us an injustice, while residential buildings are obliged to preserve a rear yard of at least 12 feet in depth. We attach much importance to the preservation of clear open spaces through the middle of each block. We would urge, therefore, a modification of the regulations for non-residential buildings in B and C districts to provide that wherever the rears of lots facing on proposed business streets abut against the rears of lots facing on residential streets, the rear 10 feet in depth of the business lots shall be left as open yards from the ground level.

Suggested amendments to the use maps

May we also call the attention of the Commission to the fact that its map of use districts shows a factory district laid out between the Eastern Parkway extension and Highland Park, so that it may become impossible to pass from the Eastern Parkway to Forest Park and out on Long Island without passing through or along the borders of a factory district for a distance of approximately half a mile. May we urge a revision of the use

plan in this particular? This seems to us within the scope of the Board of Estimate and Apportionment on recommendation of your Commission as tending to "promote the public welfare" and to "enhance the value of land throughout the city."

Referring to the tentative use map and the assignment of streets to business or residential purposes, the Brooklyn Committee has determined to leave to the residents of, or owners of property in, the various districts of the borough, expression of their own preferences.

Statement by Dr. George M. Price, Director, Joint Board of Sanitary Control, May 24, 1916

Joint Board of Sanitary Control

The Joint Board of Sanitary Control has charge of two industries—the Cloak, Suit and Skirt and the Dress and Waist industry. They have jurisdiction over 1,800 shops in the cloak, suit and skirt industry and over 700 shops in the dress and waist industry. They are mainly in the loft zone. In the two, there were working at the last investigation 85,000 employees. We come into close contact with all the shops and workers. We have also made a medical examination of a great many of the workers. We have in the last five years examined 14,649 men and women workers in these two industries.

Nervousness among garment workers

Diseases which have been predominant among those workers are mostly those of the nervous system. We have about 28 per cent of all the workers suffering from neurasthenia; there is also a large percentage who are suffering from digestive diseases. We have an undue percentage of tuberculosis, two per cent among the workers. Among tobacco workers and bakers whom I have examined for the Factory Investigating Commission a smaller percentage of tuberculosis is found than in our industries.

There are a great many factors contributing to the large extent of nervous diseases. It would be difficult to say that one condition or even several conditions are causative. There is no question, however, in my mind that the conditions of work, economical as well as sanitary, have a great deal to do with this nervousness. The workers are compelled to work in very high buildings. They are apprehensive of dangers, as to fire conditions, and rightly so. They also have much difficulty in getting down for their lunch because of the height of the building and on account of the congestion at noon time. At that time it is hardly possible for all of them to come down the elevators, especially in those big buildings. Then, again, the work of the sitting trades is itself fatiguing. Also, they mostly belong to such races as the Hebrew and Italian, and both of these peoples are excitable and more prone to nervous disorders than others. It is the current opinion among medical writers that there is a comparatively larger average degree of nervousness and proneness to nervousness and nervous disorders among Hebrews and Italians than among the other races which are working in the trades I represent.

There ought to be no building where work is done above the twelfth story. Such buildings at present in use number 177. We have 18 buildings twelve stories in height and 21 buildings more than twelve stories in height. One building is 19 stories in height and one building 20 stories in height. I have made several investigations of the workers in those higher buildings—in the twelve-story buildings and in those which are higher, and

I have invariably found that the workers in those buildings are much worse in respect to their nervous and digestive condition than in the buildings that are less than twelve stories. I ascribe this to their apprehension of danger of fire and also to inadequate facilities and bad lunches.

Elevator sickness

A great many of our girls—and 75 per cent of the workers in the dress and waist trade are girls—suffer from what they call elevator-phobia. They cannot ride in the elevators. The sudden jar of the start and the ascent or descent in elevators has a certain effect upon their nervous system. As a result of that a great many girls prefer to walk down. Of course, they can hardly walk up, but they can walk down. Some of them have a feeling of nausea. I believe we had two or three cases of fainting. I know of one factory—a 20-story building—where there were 200 workers on the top floor, and at a certain time a number of the women workers were pregnant. It was very bad for them to ride up and go down in the elevators. This condition was fraught with so much danger that fire drills in that shop were discouraged for fear they might produce a sudden panic. Fire drills may have a very bad effect upon women in the condition mentioned. The fire drills, therefore, were discontinued during that time. Several times when we have had fire drills in these high buildings we have been compelled to station men on that floor to ask those women workers not to go down. We practically control all the buildings in our trade and all the shops in those buildings are wholly under our control.

Fire drills

We are at the present time conducting fire drills in 800 shops, practically the only fire drills that are conducted in the city, with the exception of a very few conducted by the Croker Company. We have found when people are called out on these fire drills that there is less trouble in buildings up to twelve stories in height then in buildings above twelve stories in height. Even though the latter may have more exits, and even though they are more completely fireproof, and even though they may have fireproof towers, there is more apprehension and more nervousness and more evidences of panic among the employees in such buildings than among those in the lower buildings that I have mentioned.

It frequently happens that during the drill someone drops or someone faints. The result is that we very often have stoppages and obstructions, which in the case of a real fire would be fraught with a great deal of danger. We have several times been compelled to send away girls in ambulances. I have always instructed our men to watch out for such cases. As soon as they see that a girl drops and faints they remove her and take her upstairs or downstairs, whichever may be best.

Even in fireproof towers there is danger of smoke getting in and adding to the panic. They are supposed to be smoke-proof, but they cannot be smoke-proof for whenever a door is opened the smoke will come in.

Data gathered by the experience of three years of our Fire Drill Division, which at present operates in about 780 shops in the cloak and suit and dress and waist industries, throws some light on the problem of getting operatives out of tall factory buildings in case of fire or panic. These drills, however, show only the time which it requires operatives to leave the floor where they work and not the building as a whole. Our records show that an orderly exit off the floor is usually made in from about thirty seconds

to two minutes. There have been very few fire drills conducted simultaneously by all the shop owners in a building and therefore the time in which buildings may be emptied cannot as yet be determined.

The several experiments which we have made in emptying buildings show that where the whole building is drilled by us and where the individual shops have been previously instructed and drilled, and where the exits are at least two or three outside of the fire escapes, which we do not consider as exits, a twelve-story building may be emptied within five to ten minutes.

Lunch facilities in factory loft district

A great many people suffer from gastric troubles. This is due in the first place to the fact that the people are compelled to eat a dry lunch, sandwiches, etc. They live too far from their residences to get something warm to eat. It is also due to the fact that they have a comparatively short period for lunch and they are obliged to eat their food very quickly. It is also due to the congestion. It is hardly possible for a great many of the factory employees, especially on the higher floors to have the time to go down and eat their lunches in a neighboring restaurant and then have time to come back again to their work in the high buildings. They might have time if there were not such congestion. But at the noon hour the congestion in buildings is very great. All want to go down the elevators at one time, and it is manifestly impossible for them to go down all together and have time for lunch and then come back in time for their work. The time the employees have to wait at noon or at night for an elevator depends, of course, on the building, on the employees and upon the shop. The girls have frequently asked to be allowed to begin to dress themselves half hour or twenty minutes before the time of closing. They claim that if they all go out at six o'clock they will lose fifteen or twenty minutes standing near the doors of the elevators in the jam and after a day's work it is quite a hardship upon those girls and the men as well to compel them to lose fifteen or twenty minutes of their time waiting until the elevator takes them down. We have in some buildings made arrangements for the employees by which the workers have been divided into squads. Some are allowed to go five minutes earlier and they come so much earlier in the morning, so that they all don't go out at the same time, but that is only in single instances and cannot be done throughout all the buildings and shops.

Daylight in factories

The light in the shop depends very much, not only upon the window itself, its character, size, etc., but upon where the window opens to—whether to street, courtyard, etc.; also upon the height of adjoining buildings and the story in which the shop is located.

In garment factories with average windows opening upon a street of ordinary width, the operatives may work without artificial light, as a rule, between 10 A. M. and 4 P. M. to about twenty-four feet from the window. This refers to garments of light shades; on black or red garments artificial light will be necessary beyond fifteen or eighteen feet from the window.

As a rule, the light is adequate in the better class of shops lighted with electricity or well-arranged gas lights.

Eye trouble

We have found that one-third of our shops use artificial light during the day time on account of the defective illumination. A special study was made of the lighting and illumination conditions in our shops by the United

States Public Health Service. It was found in their report that the illumination was inadequate in one-half of the buildings. We have also investigated eye conditions and have found a great many eye defects among the workers due to the strain and to the defective lighting. In 69 per cent of 3,000 workers defective vision was found. In 11½ per cent the eyesight was corrected by glasses.

The defective vision in so large a number of people was due to the defective illumination of a great many of our shops. Our shops are generally in buildings 50 to 100 feet wide, running from street to street. The front part of such buildings is occupied by showrooms. The best illuminated part of the building is occupied by the showrooms while the rear part of the building is occupied by the workers. They have high partitions between the front and the rear part that entirely separates the two. The result is that the workers are almost always in the dark part of the building. There is no limitation as to the ground area that may be covered by factories as is the case in tenement houses. You can build on 100 per cent of the lot and the most of the factory buildings are so built. In many instances they run through the entire block.

Fire hazard in loft buildings

A great many of the benefits that are calculated to flow from the Labor Law are lost by reason of the fact that there is no co-ordination between the Factory Law and other laws on the construction and occupancy of buildings. Moreover, it is one thing to put a law on the books and another to administer and enforce it. We found 91 per cent of the buildings had violations. The law was violated as far as the fire-alarm system was concerned. Eighty-nine per cent were violating the law of fire egress, and 38½ per cent were violating the law in relation to automatic sprinklers.

We have found that out of 928 buildings 747 have only a single stairway, and 186 of these stairways are of a winding type, which, in our opinion, is a dangerous form. We have found one stairway only 20 inches wide, which is hardly sufficient for a stout man to pass through.

I have said many times that under present conditions if a fire should occur in some of the twenty-story buildings that have a single or even a double exit and even with the fire-alarm system that some of them have, I believe the calamity would be so much greater than the Triangle or Diamond factory fire that it would be appalling. This possibility is due primarily to the height of buildings and to the insufficiency of exits which is usual in these high buildings.

Tenement house manufacturing

We have at present 300 stores on the east side occupied by the cloak and suit and dress and waist shops. These shops are mostly in tenement houses. The rear of the shop or store is generally used as a workshop. There are from two to fifteen and even twenty workingmen in these shops. The conditions there are abominable more particularly because of the place, which is not intended for manufacturing purposes; also because of the lack of light, the unsanitary conditions, etc., and the danger of contagion on account of families living together. There are also at present 200 cellars on the east side which are used as places to work in by clothing and other industries. We have eliminated most of them in the two industries which we control.

I would prohibit all manufacturing in any residential building. I only want manufacturing done in buildings erected for that specific purpose.

So far, however, as factories can be located near residential zones, it would decrease the rush-hour congestion on our transit lines, and, what is more important, it would give the factory workers more time to sleep, more time for lunch, and more time for themselves, instead of spending their time as they do now in the cars, the subways and the elevated.

Statement by Lawson Purdy, President, Department of Taxes and Assessments, May 8, 1916

Value of real estate depreciated by haphazard development

I have been President of the Department of Taxes and Assessments since 1906, and during that time there have been an average of eight to ten thousand applications for the reduction of the assessed value of real estate filed annually with the department. I have personally examined and been familiar with more than fifty per cent of such applications. These applications gave reasons in behalf of the owner of the property for his conclusion that the assessed value is more than the actual value. By the examination of these applications I have become familiar with many of the causes for the decline in value in real estate in various parts of the city. A very large proportion of such applications contain allegations to the effect that the value of buildings has been depreciated by the erection of buildings in the neighborhood, sometimes adjoining, which covered too large a proportion of the area of the lot, or are too high, or both. Many applications have stated that the character of the neighborhood has been depreciated through the erection of buildings of great height and housing a very large number of factory workers. This intense use of the land has resulted in street congestion, both for vehicular traffic and pedestrian traffic. It has, moreover, so darkened the streets and the interior of blocks as to render neighboring buildings unprofitable.

As a result of my experience I am confident that in order to preserve the value of land, which is another mode of expressing the idea of preserving the opportunity to put land to its most profitable economic use, and to preserve the value of buildings, it is essential that no building should be permitted which would not serve as a suitable type, both as to height and as to area of land covered, for the development of all the territory suitable for the erection of such buildings. The proper height and area of land to be covered must depend upon the character of use. There must be room for vehicular and pedestrian traffic on streets. And there must be adequate light and air for every building without stealing light and air from neighbors.

Depreciation of values in loft section

The evil effects of failure to protect property owners from the ill-considered action of their neighbors, is well illustrated by the decline in the value of the land between Union Square and Madison Square, and between Seventh Avenue and Broadway. In 1911 land on Twenty-third Street, on the south side between Fifth Avenue and Sixth Avenue, was assessed at $285,000 a lot; in 1916, at $80,000 a lot. In 1911, between Fourteenth Street and Twenty-third Street, on Sixth Avenue, land was assessed from $85,000 a lot to $175,000 a lot; in 1916 the same land is assessed at $50,000 a lot to $80,000. In 1911, the lowest assessment on Fifth Avenue, between Fourteenth Street and Madison Square, was $100,000 a lot, rising to over $200,000 a lot. In 1916, the assessment ranges from $75,000 to $90,000. In the intervening cross streets, from Fifteenth Street to Twenty-second Street, loft buildings were erected, twelve stories high, and when first

erected paid so well because they stole light and air and street space from their neighbors, that owners were induced to build similar buildings, or builders were induced to pay extravagant prices for land and erect similar buildings on the theory that if one twelve-story loft building was profitable any twelve-story loft building in that zone would be profitable. Experience has shown that when the first leases for three or five years expired, and similar loft buildings had blanketed the first building, leases could not be renewed at the old figures, and often could not be renewed on any terms that would pay carrying charges. The supposed values were a delusion. The erection of loft buildings drove neighboring owners to erect loft buildings, for their old buildings were no longer suitable for the neighborhood, the value of such buildings was destroyed, and the value of the land seemed to have acquired double its former value or more. Today the assessed value of lots in some side streets has declined to a sum less than the land was worth prior to the boom. The old buildings although often so well constructed as to last for one hundred years have practically no value at all.

Depreciation of values in downtown office section

Somewhat similar results have followed in the office building zone from the failure there to protect the owners of buildings of reasonable height from deprivation of light, air and access, by the erection of neighboring buildings of monstrous heights, and covering all the land the law allows, which is substantially all there is. I suppose I have heard applications for reduction of the assessed value of at least three-fourths of all the buildings of more than ten stories high south of Chambers street. The reasons for the requests have been similar to the reasons for the requests for the reduction of the assessed value of many of the loft buildings in the middle of the borough. An office building which was profitable when it stole its light and air was rendered unprofitable when there was no longer light and air to steal. The value of land has been inflated on the theory that on certain streets the appropriate improvement is a building approximately thirty stories in height. It must be obvious that the land cannot be covered with buildings thirty stories in height and profitably rented, even if there were people enough who wanted to do business in that territory to fill the buildings. There would be no room for the people to walk in the streets. They would all work by artificial light, and ventilation would be wretched, except when we had violent gales which obtain around lofty buildings when there is a moderate breeze. I have in mind one parcel of land on which there is erected a twelve-story office building of good construction, not more than twenty years old, it is full, at fair rentals. The gross rent is $55,000. The assessed value of the land is $500,000. The building was assessed last year at $150,000. One of the best appraisers of the city appraised the property for the owner at a total sum of $550,000, of which $50,000 was assigned to the building. I asked him what sort of a building he would erect if that building now on the property were destroyed by fire. He said he could not erect a better building than the one that stands there now, that it would not be profitable to erect a higher building. I then asked him whether such a new building could earn four per cent on its cost and four per cent on the value of the land that he had assigned to the lot after paying operating expenses and taxes, without any allowance for depreciation. He said it certainly could not. After some discussion we both concluded that while it is necessary to appraise the land as having a value of about $500,000, based on sales of neighboring property, and on the opinions of

those best informed, and on the rental values obtained in buildings within a few hundred yards, which were more than twenty stories high, and still can steal light and air from their neighbors, that nevertheless, such a land value was a mirage and an illusion; that no use to which the land could be put would yield a return of four per cent on such a value. There are many such cases and I describe this in detail to illustrate what I call a fictitious value that comes to land based on the erroneous theory that all land in a given neighborhood can be put to as an intensive use as the most intensively used land. And again we come back to the proposition that no building should be permitted which would not serve as a suitable type for the development of the entire area appropriate for such buildings. I have known a number of cases where office buildings, when first erected, were profitable, and subsequently they were hemmed in by other buildings to such an extent that the rentals were seriously reduced on account of the lack of light and air. I have in mind a building on the corner of two streets, which for some years enjoyed the light and air that belonged to its neighbors on the south for about sixteen stories of its height. It also had a similar advantage on the east. A few years ago an office building of equal height, about twenty-two stories, was erected south and east of it, and the owner thereupon requested a reduction of the assessed value and made the allegation that as to a large percentage of the rooms having windows to the south and east the rent was reduced by two-thirds, because the windows were in most cases entirely closed up, and in others the windows were on a court, to small to give any light and ventilation to amount to anything below three stories from the roof. I knew the building in its condition prior to the erection of the building adjoining and I know it well now, and if it were not for very good management I can hardly see how the southerly rooms could be rented for anything but storage.

Effect of Equitable Building on surrounding property values

A notable illustration of the evil effect of the erection of a building that is too high and covers too much of the land is that of the new Equitable Building, at Broadway, Pine and Cedar streets. After the old Equitable Building was destroyed, the owners of some of the land that surrounds that block negotiated with the Equitable for the purchase of an easement of the light and air from a point above eight stories from the ground; in other words for a limitation upon the Equitable to the construction of a building eight stories high. I am informed that for two and a half million dollars the Equitable Corporation was willing to sell such an easement and that the owners of the surrounding property subscribed two and one-quarter million dollars to buy that easement. The project failed because the owners who would have been required to contribute the additional quarter of a million were not in a favorable position to make their proportionate contribution and were unable or unwilling to do so. One of the owners who had agreed to contribute a large part of the sum required told me that he regarded the advantage to the property that he represented as being at least twice as valuable as the sum he had agreed to contribute.

Since the commencement of the present Equitable Building, a structure about forty stories high, the owners of practically all the property surrounding it have asked for and obtained a reduction of the assessed value of their property on proof of loss of rents due to limitations of light and air and other advantages they enjoyed when the Equitable Building was only nine stories high.

Need of protection against reckless building

An illustration of the evil effect of the failure of the city to protect the owners of property from the erection of improper buildings is found in the territory lying near Broadway between 59th Street and 125th Street, and on West End Avenue, Riverside Drive, and the east and west streets lying between. The Tenement House Law, which limits the height of a building to one and a half times the width of the street, and imposes some slight limitations on the area of ground that may be covered, has been of value, but these limitations are entirely insufficient and have been insufficient so far as tenement houses themselves are concerned. The limitation upon hotels is only a limitation of area, and has proved wholly inadequate. There are today a few apartment hotels in the territory described which are but twenty-five feet wide and rise to a height of thirteen stories. The intrusion of these wretched buildings has depreciated the value of the neighboring single family dwelling houses, and I am informed that they themselves are regarded as such extra hazardous investments that their value cannot be predicated upon rentals secured while they steal light and air for nine stories of their height. Should these buildings be blanketed by others they would probably, with a reasonable regard to the health of the occupants, be uninhabitable, and it is clear that the same restrictions as to height and possibly more onerous restrictions as to area should apply to hotels as apply to any other buildings for human habitation. A hotel should no more be allowed to steal its neighbors' light and air and street area than any other building. And the same principle applies in this territory as applies in all other sections—that no building should be permitted which would not serve as a suitable type as to height and area for the complete development of the whole district, leaving to all adequate light, air and access, and safety from fire.

Invasion of private house sections by apartment houses

Tenement houses, more euphoniously called apartment houses, built to the full limit allowed by law, have intruded into a territory beautifully developed with single family dwellings at great cost, well constructed, in condition to last for a hundred years, and have destroyed their value in large measure. The first tenement house when it can freely steal its light and air is profitable. When it must depend on the light and air it furnishes for itself, on its own lot, it frequently becomes unprofitable. When a wide street is developed from end to end with buildings one hundred and fifty feet high, the buildings on the street to the rear are deprived of light and air to such a degree that they are no longer profitable as a rule and frequently must be unhealthful. The servant problem, ever with us, is complicated and rendered impossible of decent solution by the fact that in such blocks there is not one single light kitchen—not a kitchen into which a direct ray of sunlight ever enters.

Fictitious land values

In the whole territory just described we have cases again of fictitious land values—values predicated upon the possibility of the erection of a twelve-story tenement house that steals light and air as I have shown. When that larceny is prevented profit is not there, and land values prove to have been a mirage. The pathetic instances of single family dwellings sandwiched between buildings of ninety feet and one hundred and fifty feet appeal to one who knows what sacrifice of value has resulted and what

miserable conditions of human habitation exist. Any sixty-foot street that may fully be developed with nine-story apartments ninety feet high, is in my opinion unfit for human habitation, and exercises a like influence upon the adjoining parallel street. On the other hand, a street sixty feet wide, developed with six-story apartments, is a reasonably fair street. Personally, I think the height is too great, and that were it now possible, it would be infinitely better to restrict the height to once the width of the street. An angle of forty-five degrees produced by the rule of once the width of the street is insufficient to give direct sunlight on short winter days to the lower stories. Surely, that should be the limit.

Districting a benefit to real estate

Not only will the plans as tentatively submitted by this Commission not work any general hardship upon owners of real estate, but I shall be greatly surprised if there is any hardship anywhere of any consequence, and I am profoundly convinced that the future welfare—financially—of the owners of real estate is dependent upon the speedy enactment of restrictions as to height, area and use, at least as restrictive as those now presented by the Commission.

In my opinion the isolated cases wherein an individual owner may suffer some hardship because of the peculiar location of his property will be very few. Some such possibilities have been presented to the Commission, and it seems possible that in some few localities a certain relaxation of the rules will be made. Such relaxations, if any, should be made solely to meet the improper conditions that have been produced by the failure to impose proper restrictions in the past.

The failure to impose proper restrictions upon uses to which buildings may be put has caused enormous loss to the owners of real property, and has in many cases rendered buildings of good character hardly suitable for human habitation by reason of the deprivation of adequate light, air and access, as well as the objectionable noises and other like incidents of a manufacturing industry.

There are many instances where the owners of adjacent properties have erected artificial structures to shut off the light from the windows of buildings erected adjacent to their property. In other words, individual owners have conducted schemes of retaliation in defense of their property. Sometimes such structures have not been erected as schemes of retaliation, but solely to shield tenement houses from obnoxious sights and odors.

In practically every case where there are tenement houses or single family dwelling houses, and a stable or a garage is erected in proximity to them, there follows a request for a reduction of assessed value of the property near by, which is almost always injuriously affected in its value by the proximity of such a building so used.

Lack of regulation harmful to city owned property

The shifts and changes of populated centres which come about from the reasons already described, that is, intrusion of factories into residential territory, cause direct loss to the city through rendering unsuitable for the location, schools erected at large expense and also court houses. Little parks that have been acquired for breathing spaces, or playgrounds, become useless for the purposes for which they were designed when the residents of the neighborhood move away in consequence of the destruction of the tenement houses and their replacement by factories. This sort of change usually comes because of the intrusion of one factory which starts the pro-

cession. The only way to deal with it is by laws excluding factories; and this is only a protection of the rights of the property owners themselves. The plan proposed by this Commission is absolutely necessary to save the city in the matter of its own public buildings inestimable loss as well as the frustrating of the full fruit and results of the purpose for which a large portion of these public buildings have been erected. We have seen such destruction of value happen in the past, and it will come in the future in the same way to a greater degree unless we speedily adopt appropriate restrictions, and the restrictions now proposed seem appropriate for the purpose.

Assessed value of city owned property

The assessed value of the property owned by the City of New York in 1915 was $1,502,000,000, while the aggregate assessed value of all the real property that is taxable was $8,108,000,000. Of this great investment of a billion and a half by the city, $123,000,000 represented the assessed value of school sites, schools and other property under the jurisdiction of the Board of Education. The assessed value of parks was $673,000,000. The assessed value of the property under the jurisdiction of the Departments of Charity and Correction, which includes numerous hospitals, amounted to $54,000,000. Property of a semi-public character, owned by private corporations and exempted from taxation because of its semi-public character, was assessed in 1915 for $392,000,000. That sum included $36,000,000 for hospitals, $46,000,000 for colleges and schools, and $192,000,000 for churches, parochial schools, and their usual adjuncts.

For 1915 the aggregate number of buildings that were assessed as taxable was 386,000. Of this total number 338,000 buildings were devoted to human habitation, of which 153,000 were houses constructed for single family dwellings, 78,000 were two-family dwellings, and 103,000 were tenement houses. It will be noticed that the number of buildings devoted to human habitation is about 88 per cent of all the taxed buildings in the city. The assessed value of all the structures that are subject to taxation was $2,884,000,000. It is apparent, therefore, that the conservation of the value of these buildings is of immense importance to the general welfare of the community.

From what I have already said in regard to the effect upon the value of the land of the intrusion of inappropriate uses and inappropriate structures, it must be clear that to conserve the financial stability of the city and its power to incur indebtedness and pay its debts, it is most important to conserve the land value. The value of ordinary land, that is, land other than special franchises, and the right of way of public service corporations, was assessed in 1915 for $4,643,000,000.

Statement by Martin S. Rourke, Real Estate and Insurance, April 29, 1916

Effect of gaseous fumes on vegetation

Mr. Rourke stated that the gaseous fumes emitted by the chemical companies in the vicinity of Newtown Creek destroyed the paint on neighboring buildings within forty-eight hours of its application. Truck gardening in this locality he stated was just as impossible as in the Desert of Sahara, the gaseous fumes killing all vegetation.

Statement by Amos Schaeffer, Consulting Engineer, Borough of Manhattan, May 15, 1916

Sewer systems

All sewer systems for carrying off domestic sewage and surface drainage from cities are generally divided into two classes, namely, combined and separate. In the combined system, sewers are built to take both the storm water drainage and the domestic sewage, which is usually discharged into some adjacent stream or harbor. In the separate system there are two independent systems of sewers, one of which carries off the storm water and the other the domestic sewage. The latter system is generally installed when it is intended to purify the domestic sewage before it is finally discharged.

Inland cities and towns which discharge their sewage into fresh water streams usually are required to treat their sewage to a high degree of purity before discharging it, because the same stream is frequently used as a source of water supply by some other municipalities.

Operation and final disposition

The combined system of sewers practically requires no attention for its operation with the exception of seeing that the sewers are cleared of obstructions and are kept in proper repair.

The sewage from the separate system of sewers is usually purified to a sufficient degree of refinement so as not to pollute the waters into which the effluent is discharged. These purification plants generally consist of grit chambers, screens, sedimentation tanks and filters. One or all of these processes are used according to the degree of purity required in the final effluent.

Development of the sanitary system

Before the introduction of a water supply into cities, the domestic sewage is usually allowed to flow into cesspools. When a municipality has increased sufficiently to require a general water supply, the sanitary conditions also require improvement and cesspools are usually superseded by sewers built in the public highways, which serve all the property fronting on them. In the case of seaboard cities, these sewers usually discharge into the adjacent harbors without any purification.

Condition of sewers in New York City

Sewers were constructed in this city as early as 1840 or thereabouts. At that time cement was not available and the mortar used in their construction consisted usually of oyster-shell lime and sand. Due to the chemical action of the sewage, the mortar has deteriorated to such an extent that a great many of the sewers have practically none left in the joints, as a consequence of which they are collapsing. At the time these early sewers were constructed the science of sewer design had not advanced to the degree of accuracy of to-day.

The conditions under which these sewers were designed were also different from the present. The pervious area was very much larger than it is to-day, in consequence of which a considerably smaller quantity of rain water reached the sewers and a much larger quantity was absorbed by the soil. The roadways of the streets were usually paved with a waterbound macadam or with some other material which was much more pervious than the present pavements, and sometimes they were not paved at all; and the sidewalks were frequently paved for a width of only four feet. The build-

ings usually occupied a smaller percentage of the lots and the portion not occupied by buildings was cultivated as a garden or a grass plot, whereas at present the back lots, in the most populated sections of the city at least, are paved with an impervious material such as bluestone, cement or asphalt.

It was, therefore, quite proper that the sewers should have been designed for a considerably smaller run-off of rainwater than at present. In consequence of these conditions and the more or less inaccurate theory of sewer design based upon them a great many of the sewers which were built at that time are inadequate for present requirements, so that during heavy storms property is frequently damaged on account of the backing up of the sewage through house drains. In fact, there are some locations in the city where in excessive storms the sewers overflow on the surface of the street and over the sidewalks.

Need of reconstruction of sewers

It will be seen, therefore, that there is need of reconstruction of sewers in the older portions of the city for the two reasons hereinbefore described, namely, on account of deterioration and on account of inadequacy.

Redesign of drainage areas

Before a general reconstruction of the sewers can be undertaken it will be necessary to redesign the drainage areas and provide for sizes and grades of sewers in accordance with the changed conditions and the present science of sewer design.

This practically means the installation of a new sewer system, because it will readily be seen that very few of the older sewers can be incorporated in the new system. Of course it is not the purpose, when the reconstruction of sewers is undertaken, that all existing sewers should be dug up regardless of their physical condition, but it is the purpose to bring about this change gradually, as the sewers deteriorate or are inadequate.

Pollution of the harbor

Since the time that New York City has used the present water carriage system of sewers, the sewage has been discharged into the adjacent waters of the harbor without any treatment, with the exception of a few installations in the Boroughs of Brooklyn and Queens. The purification plants in these boroughs have been constructed comparatively recently and they treat a very small percentage of the total volume of sewage which is discharged, so that their influence upon the pollution of the harbor is comparatively insignificant.

The harbor waters, therefore, are more or less saturated with the sewage which has been discharged into them during the last 75 or 100 years. In some of the more confined portions of the harbor, such as the East River and the Harlem River, where the tidal movement does not extend to the purer waters of the Sound or the ocean, this pollution is so great that offensive putrefaction is liable to set in at any time under favorable conditions.

Purification of the sewage

In the design of a new sewer system it will therefore also be necessary to take into consideration the purification of the sewage before it is discharged into the harbor. The City of New York is practically committed to a general purification of its sewage, although this may not be necessary

at every individual outlet. In order to treat the sewage under the tidal conditions which exist in the harbor waters, it will be necessary to install a separate system of sewers, at least in certain portions of the drainage area, to take the place of the combined system which has been generally in use up to the present time.

Sewage purification plants will be installed to purify only the domestic sewage and a small quantity of the storm water. To purify the domestic sewage in the combined system it is necessary to construct a weir or some other device to divert all the domestic sewage to the purification plant. By this device the early run-off from the street, which contains a considerable quantity of street sweepings, is also carried to the disposal plant. It is only after a rainfall of two or three times the volume of domestic sewage that it overflows directly into the harbor without purification. In the latter case, however, the sewage is very much diluted and therefore carries a comparatively small quantity of organic matter into the harbor.

Effect of height of buildings on sewage purification

While the quantity of domestic sewage from even very tall buildings does not exert a very marked influence upon the size of the sewers required under the combined system, it adds very materially to the quantity of sewage which has to be purified. It can be seen readily that while the area still governs the quantity of storm water which reaches the sewer, but which will not be purified, the quantity of domestic sewage which will be purified depends entirely upon the consumption of water, which in turn generally depends upon the population and the height of the buildings and also upon their use.

In order, therefore, that a purification plant may be designed of proper capacity to treat the sewage from a certain area, it should be known in advance what the development of that area will be, both as to the population which will occupy the buildings, which is directly dependent upon their height, and also upon the use to which they are put.

The segregation of factories to certain areas is, therefore, very desirable, from the standpoint of sewage disposal, so that purification plants may be designed for the particular kind and quantity of effluent which manufacturing industries contribute, because it is frequently necessary to adopt a method of purification adapted to the particular kind of trade waste which is produced. If it is known, therefore, what the quality of the sewage in the different sections of the city is, purification plants can be designed to treat it.

It is my opinion, therefore, that the regulation of the use, height and area of buildings will have a large economical influence upon the design and installation of the sewers and purification plants.

Statement by Wm. Jay Schieffelin, Chairman, Citizens' Union, May 5, 1916

City should have been districted long ago

The Citizens' Union recognizes in the work of your Commission the first belated step on the part of the city toward an orderly development and the protection of property owners against their own short-sightedness. Your tentative report indicates the care and thoroughness with which the work has been conducted. The principles followed and the recommendations made in this report must, in the main, meet with the approval of every person

seriously concerned in the safeguarding of property values and a growth which will insure better and more stable working and living conditions.

The districting of the city, as finally determined by the Board of Estimate, should represent the highest standards which can properly be established throughout the city, based upon a study of community conditions and a forecast of the character of future growth. It would manifestly be unfair to a locality to set its standards too low and attempt to raise them later after the mistake had become apparent as a result of extensive building operation. Under such circumstances the city would be placed in exactly the same position in which it now is with respect to much of its built-up territory. It is in the hope that this possibility may be reduced to a minimum that we urge your serious consideration of the recommendations of the City Club to your Commission, as contained in the communication of Mr. Frank B. Williams, Chairman of its City Planning Committee, dated April 11, 1916, in which we most earnestly concur.

More stringent restrictions desirable

We desire to emphasize briefly what we consider the three most serious defects in your proposals, knowing that your tentative report was made public primarily for the purpose of honest criticisms:

(1) We believe you are inviting the defeat of your purpose to exclude industry from business districts by permitting the use of 25 per cent, or two floors, of any building in a business district for industrial purposes. Two-story factories are possible, in fact, common in outlying boroughs. To insure strictly "business districts," this allowance must be materially reduced.

(2) Examination of the height district maps convinces us that there are many districts, particularly in Brooklyn, where the height limit should be set at a much lower point. When an area is generally built up with two to four-story residence buildings, are you not encouraging an unnecessary invasion by permitting eight and nine story structures? The stricter standard should be established where possible. It is easier to lift a restriction than to impose it later if experience proves it to be undesirable.

Moreover, we must not overlook the fact that the height restrictions imposed by your plan are not maxima. By stepping back higher buildings may be erected if they are economically necessary. But if there must be such additional congestion, some amelioration should accompany it. That is provided by the stepping back and increased court and area requirements.

(3) The area limitation for residence buildings under Class "C" should be more stringent; especially for buildings under eight stories in height. The requirements should be increased wherever possible. We believe you will find it possible in a great many districts.

We consider these phases of your report deserving of reconsideration; in fact, we feel that a revision along these lines is essential if the principles underlying your work are to be carried out.

Statement by Louis Schrag, March 28, 1916

Car barns

Car barns should be excluded from the business districts. A car barn not only ruins the block in which it is located, but also the block on either side of it. Car barns should be put in the unrestricted districts.

Stables and garages

Livery stables and public garages should also be prohibited in the business districts. Both depreciate property values. The Concourse in The Bronx is an illustration of a thoroughfare laid out as a fine residential boulevard, which has been ruined by the invasion of public garages. This is particularly the case in the vicinity of Fordham Road, where a half dozen public garages have been built. Here, instead of the fine residential development which was expected, cheap tenements are being built. Public garages and stables should be obliged to go into the unrestricted districts. The unrestricted districts are so situated that this limitation would not inconvenience the business of either stables or garages.

Private garages and stables need not, however, be restricted to the unrestricted districts. They do not interfere with business.

STATEMENT BY THE REVEREND WILLIAM J. STEWART, MANAGING DIRECTOR, ALLIED CATHOLIC CEMETERIES, APRIL 18, 1916

Injury done by chemical factories

Chemical factories should be restricted in the vicinity of Calvary Cemetery. We know that they do irreparable damage to bronzes, to Carrara marble statues, to granite foundations, to grass and trees. We know that for a fact, but when we go to the authorities of these factories to make a protest and ask if they cannot do something and get their chemists at work, the same as they did in some other chemical factories, and use the wastage over again that comes from the chimneys, they say, " well, prove to us that we do it and we will stop it." Well, now, they ought to be able to prove it. We can see the damage done. We know that on the bronzes there is a verdigris and there is a peculiar scale on the vegetation. We have difficulty in making the grass grow. All our trees are dying. We cannot make it what we would like to make it, park-like and a breathing place for the people. It is really dangerous for people to travel at certain times of the day to Calvary Cemetery on account of those acid fumes.

STATEMENT BY HERBERT S. SWAN AND GEORGE W. TUTTLE OF THE STAFF OF THE COMMITTEE ON CITY PLAN, MARCH 15, 1916

Relation of height and area regulations to sunshine

The building requirements in Manhattan have in the past been so lax that it is safe to say that a preponderating majority of rooms in the existing shops, factories, offices and apartments receive absolutely no direct sunshine on the shortest day in the year.

The height and area regulations now being considered will have the tendency of remedying this condition. By limiting the height of buildings with reference to the street width and by requiring all windows to open out on either streets or open spaces of a prescribed size the zone plan will provide a larger supply of direct sunshine not only in the interior of all new residence and business buildings but also in the streets.

The following paper shows the relation of these provisions to the duration and quantity of direct sunshine obtained under different conditions at New York City (40° North Latitude) as on December 21st.

Length of shadow cast by different skyscrapers

At noon on the shortest day in the year the shadows of different skyscrapers envelop large areas. The Adams Express Building, which is 424

feet high, casts a shadow 875 feet in length; the Equitable Building, which is 493 feet high, one 1,018 feet in length; the Singer Tower, which is 546 feet high, one 1,127 feet in length and the Woolworth Tower, which is 791 feet high, one 1,635 feet in length.

The effect of skyscrapers casting shadows from a sixth to a third of a mile in length on surrounding property is well illustrated in the case of the Equitable Building. Its shadow, which at noon on December 21st is about one-fifth of a mile in length, completely envelops an area of 7.59 acres. The area of the Equitable Building is only 1.14 acres.

The shadow cuts off all sunshine from the Broadway facade of the United States Realty Building, which is 21 stories high. The Title Insurance Company Building, 14 stories high, and the Washington Life Insurance Building, 19 stories high, though in the next block, are both completely shaded. The south side of the Singer Tower is shaded to a height of 27 stories. The nearest part of the City Investing Building 400 feet away is in shadow for 24 of its 26 stories. Even part of the New York Telephone Building north of Cortlandt Street is shadowed by the Equitable Building. For almost a fifth of a mile this giant skyscraper casts its shadow. The area cut off by it from all noonday sunlight extends to within 100 feet of Fulton Street.

Cedar Street, the street immediately north of the Equitable Building, has an average width between Broadway and Nassau Street of 34 feet. The height of the Equitable Building is 14½ times the width of this street. On a north and south street of this width in New York, uniformly improved on both sides with buildings having a height equal to that of the Equitable Building, only 9.31 per cent of the windows would receive any direct sunshine at noon on the shortest day in the year. On north and south streets only the windows nearest the top for a distance equal to 1.35 times the width of the street would receive direct sunshine at noon on December 21st at New York (40° North Latitude). The windows in the first 34 stories nearest the ground would receive absolutely no direct sunlight. Direct sunshine would only enter those windows in the four stories nearest the top. Not a single window within 447 feet of the street level would receive a ray of direct sunshine!

Per cent of windows receiving direct sunshine with buildings of different heights

The Equitable Building is, of course, an extreme case. But even in much lower buildings a considerable number of the windows on north and south streets receive absolutely no direct sunshine at the winter solstice. Up to a height equal to 1.35 times the width of such a street all the windows (assuming they fulfill the standard requirements described below) receive *some* sunshine. If the street, however, is improved with buildings one and one-half times the street width in height only 90 per cent of the windows obtain direct sunshine. If the height be increased to two times the street width the proportion receiving direct sunshine is reduced to 67.5 per cent. The number of windows receiving direct sunshine on north and south streets with buildings of different heights is as follows: two and one-half times, 54 per cent; three times, 45 per cent; four times, 34 per cent; five times, 27 per cent; and six times, 22.5 per cent.

Duration of sunshine period in rooms

In this connection it must be remembered that all windows receiving sunlight do not obtain the same amount. Even though there be no buildings

on the opposite side of the street 28 per cent of the sunshine period on a north and south street is cut off by the thickness of the wall in which the window is set. Where the opposite buildings rise to a height above the window equal to .2 times the width of the street, 35 per cent of the sunshine period is cut off; where it rises to a height .4 times the width of the street, 44 per cent is cut off; .6 times, 54 per cent; .8 times, 65 per cent; 1.0 times, 77 per cent; and 1.35 times, 100 per cent. This is for a wall 14 inches thick. For a thicker wall the percentage would in each case be more; for a thinner wall less.

A window in a north and south street situated in a position where the height of the buildings opposite it is .2 times the width of the street above its center level receives direct sunlight for a period the length of which is only 72 per cent of that received by an unobstructed window; where the height of the buildings opposite is .4 times, 50 per cent; .6 times, 33 per cent; .8 times, 21 per cent; and 1.0 times, 12 per cent.

The duration of the sunshine period on the facade and in the rooms on a north and south street at the winter solstice is shown in the following table for different points below the top of the opposite buildings:

SUNSHINE PERIOD ON NORTH AND SOUTH STREET AT NEW YORK, DECEMBER 21ST (40° NORTH LATITUDE)

Height of Opposite Buildings Times Street Width Above Center of Window	Minutes of Sunshine Striking Entire Street Facade	Minutes of Sunshine Entering Window in Wall Fourteen Inches Thick	Per Cent of Sunshine Period of Street Facade Cut Off From Window at Each Height	Per Cent of Period That Sunshine Enters Window at Different Heights in Terms of That Entering Unobstructed Window
.0	275	198	28	100
.1	247	170	31	85
.2	219	142	35	72
.3	195	118	40	60
.4	175	98	44	50
.5	156	79	49	40
.6	142	65	54	33
.7	129	52	59	26
.8	118	41	65	21
.9	108	31	71	16
1.0	100	23	77	12
1.35	77	0	100	0

Sunshine obtained on the street

A north and south street at New York improved with buildings on only one side of the street receives at least four hours and 35 minutes of sunshine at the curb level on all parts of its surface on December 21st. If buildings are erected on both sides to a uniform height of one-half times the street width the entire surface of the street at the curb level receives but two hours and 36 minutes sunshine. If the buildings are increased in height to one times the street width the pavement receives only one hour and ten minutes sunshine. In case of buildings two times the street width the sunshine period is one hour; two and one-half times, 47

minutes; three times, 41 minutes; four times, 34 minutes; five times, 30 minutes; and six times, 27 minutes.

To obtain a half hour sunshine on the entire surface of the street at the curb level on a north and south street in New York on the shortest day in the year, the buildings must be limited to 3.7 times the street width in height; 45 minutes, 2.4 times the street width; one hour, 1.8 times; an hour and a quarter, 1.4 times; an hour and a half, 1.1 times; an hour and three-quarters, .9 times; and two hours, .8 times.

Volume of sunshine entering windows

The volume of sunshine received in rooms is of just as much importance as the sunshine period. A room, for instance, may enjoy direct sunshine for a considerable period and yet have a comparatively small portion of its cubic contents aerated by direct rays from the sun. The best unit for measuring the effect of sunshine entering rooms is the cubic foot sun hour, that is, a cubic foot of space illuminated by the sun for one hour.

The amount of direct sunshine entering a window decreases far more rapidly with increased height of buildings than does the sunshine period.

The data given below for the amount of sunshine is calculated for a window with a pane 32 inches wide and 61½ inches long, the opening between the stop beads being taken as 36 by 66 inches and the inside dimensions of the masonry being taken as 40 by 70 inches. The room considered is one 14 feet square. The distance between the center of the window and the south wall of the room used in the computation is five feet and the height of the window sill above the floor of the room two and one-half feet.

The volume of sunshine entering the room through this window, whether obstructed or unobstructed, is shown graphically by the curve in Figure 56. The amount of sunshine in cubic foot hours entering the window is shown by the curve in Figure 58. The cross section of a bundle of sun rays entering this window is shown by the curve in Figure 57.

At the winter solstice a standard window on a north and south street in New York fulfilling the above requirements and set in a 14-inch wall and situated at a point equal to one-tenth the width of the street down from the top of the buildings on the opposite side of the street enjoys a sunshine period 85 per cent as long as that enjoyed by an entirely unobstructed window. The amount of sunshine enjoyed is, however, only 71 per cent of that obtained by an unobstructed window. This disparity between the sunshine period and the sunshine quantity increases with added height of buildings. At a point equal to one times the width of the street below the top of the buildings on the opposite side of the street the sunshine period enjoyed by a window is 12 per cent of that enjoyed by an unobstructed window though the amount of sunshine is only about one per cent. Here again the thickness of the wall is to a large extent the controlling factor. Where the opposite building obstructing the window is a low one the disparity between the sunshine period and the sunshine quantity is not very much greater in a thin wall than it is in a thick wall. This disparity, however, increases considerably in the case of high opposite buildings. The quantity of direct sunshine admitted by a window set in a wall 8 inches thick on a north and south street and situated at a point equal to one times the street width below the top of the opposite buildings is 6.5 times that admitted by the same window similarly situated but in a 14-inch wall.

CROSS SECTION OF BUNDLE OF SUN RAYS ENTERING WINDOW.

Calculated for given window opening on north and south street. Latitude 40°N.
Winter solstice

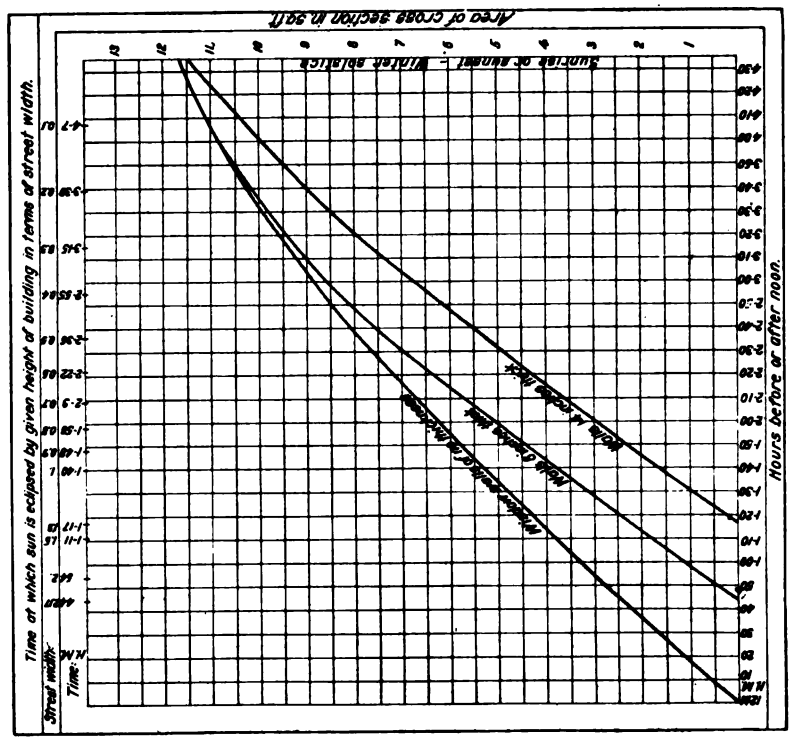


Fig. 57.

VOLUME OF SUNSHINE ADMITTED BY WINDOW.

Calculated for given room with window opening on north and south street. Latitude 40°N.

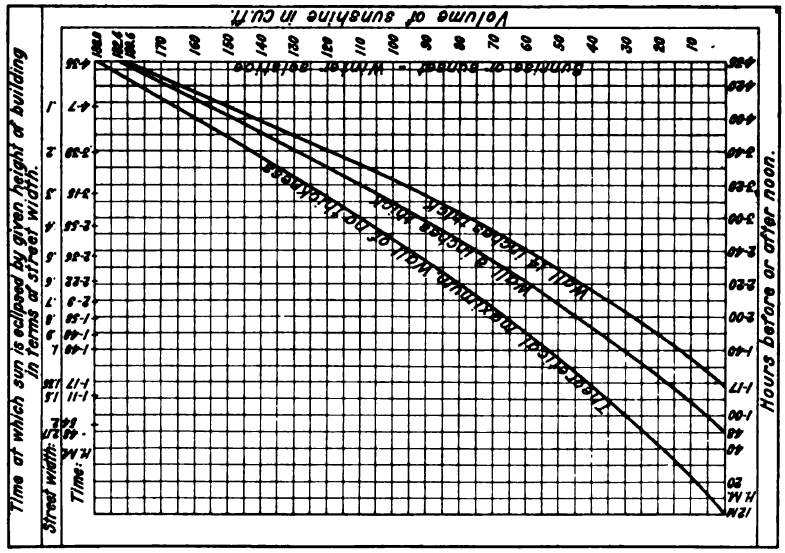


Fig. 56.

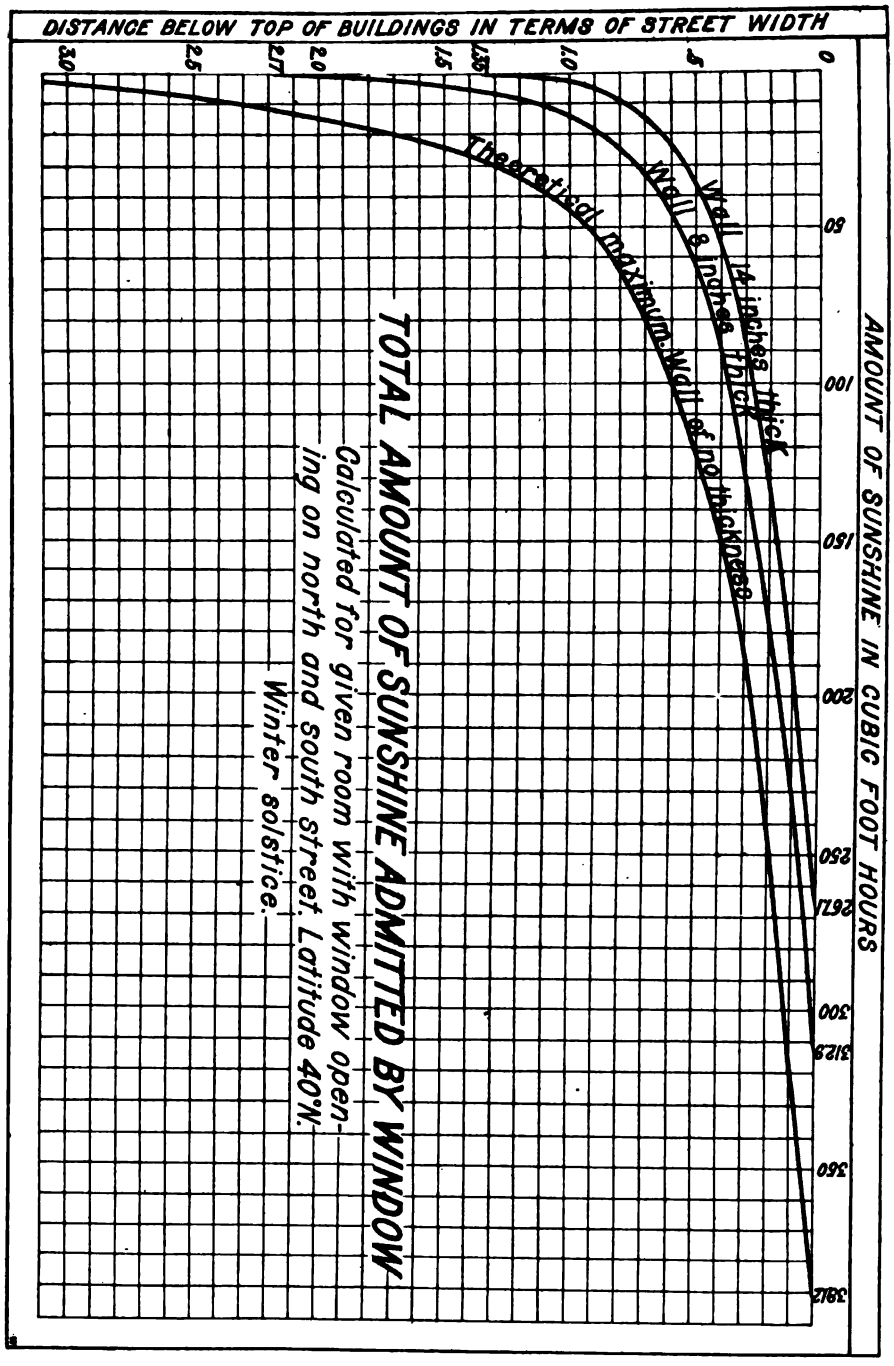


FIG. 58—SUNSHINE ADMITTED BY WINDOW.

The quantity of sunshine admitted in terms of cubic foot sun hours by our standard window, the center of which is located at different distances below the top of the opposite buildings is indicated in the following table. This table shows the quantity of direct sunshine admitted by a window set in a wall 14 inches thick, one eight inches thick and one of infinitesimal thinness.

WINDOW OPENING ON NORTH AND SOUTH STREET

Distance of Center of Window Below Top of Opposite Buildings in Terms of Street Width	Cubic Foot Sun Hours Admitted by Standard Window		
	In Wall Fourteen Inches Thick	In Wall Eight Inches Thick	In Wall of Infinitesimal Thinness
.0	267.1	312.9	391.2
.1	189.2	232.8	316.9
.2	138.4	168.1	248.0
.3	84.1	132.0	184.2
.4	54.4	88.7	158.4
.5	35.2	62.4	135.2
.6	24.0	47.9	108.8
.7	14.6	33.6	84.8
.8	9.2	24.5	63.9
.9	5.3	19.2	55.2
1.0	2.8	18.2	46.2

STATEMENT BY HERBERT S. SWAN AND GEORGE W. TUTTLE, OF THE STAFF OF THE COMMITTEE ON THE CITY PLAN, MARCH 31, 1916

In the lighting of buildings, daylight is more important than sunshine. Daylight is the sunlight diffused and reflected by the sky and clouds as distinct from that received directly from the sun. Sunshine is obtained from but one point, viz., the sun. Daylight, on the other hand, is obtained from the whole visible sphere of the sky.

Professor O. H. Basquin, of the American Luxfer Prism Company, in 1907 made a series of observations with a flicker photometer recording the intensity of the zenith skylight at Chicago under varying conditions. These measurements which were taken daily at 9 a. m., 12:30 and 4:30 p. m., covering a two year period, showed the mean annual brightness of the zenith sky at Chicago to be 500 foot candles per square foot. The intensity taken as a working minimum was one-half of the mean annual brightness or 250 candles per square foot. This amount was generally available as a daily average except on one or two days a month—on days with either a clear blue sky or a stormy sky, both of these conditions giving a minimum illumination. The sky at various altitudes gave substantially the same illumination as at the zenith.

The curve showing the brightness of the sky follows quite closely the mean daily and yearly sunshine curve. The per cent of annual sunshine to the maximum possible varies in different cities of the United States all the way from 36 to 84 per cent. In New York it is 58 per cent. The hourly per cent of the maximum possible sunshine in New York is shown by the curve in Figure 59.

Assuming that Prof. Basquin's data for Chicago is true for New York after allowing for the difference in the per cent of annual sunshine the mean annual brightness of the zenith sky in New York is 560 candles per

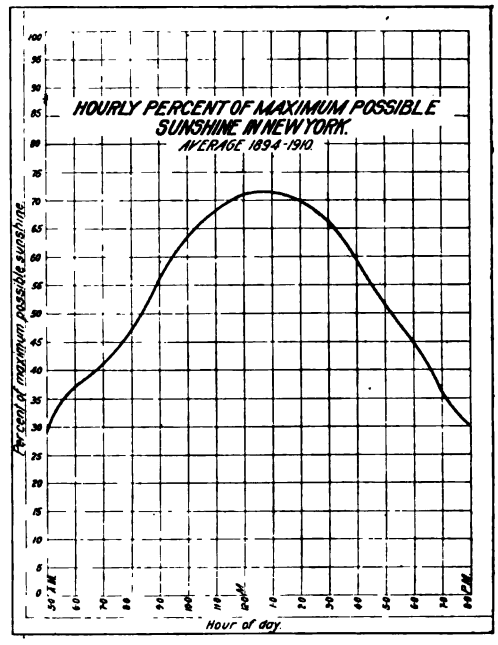

HOURLY PERCENT OF MAXIMUM POSSIBLE SUNSHINE IN NEW YORK.
AVERAGE 1894-1910.
Percent of maximum possible sunshine.
Hour of day.

FIG. 59.

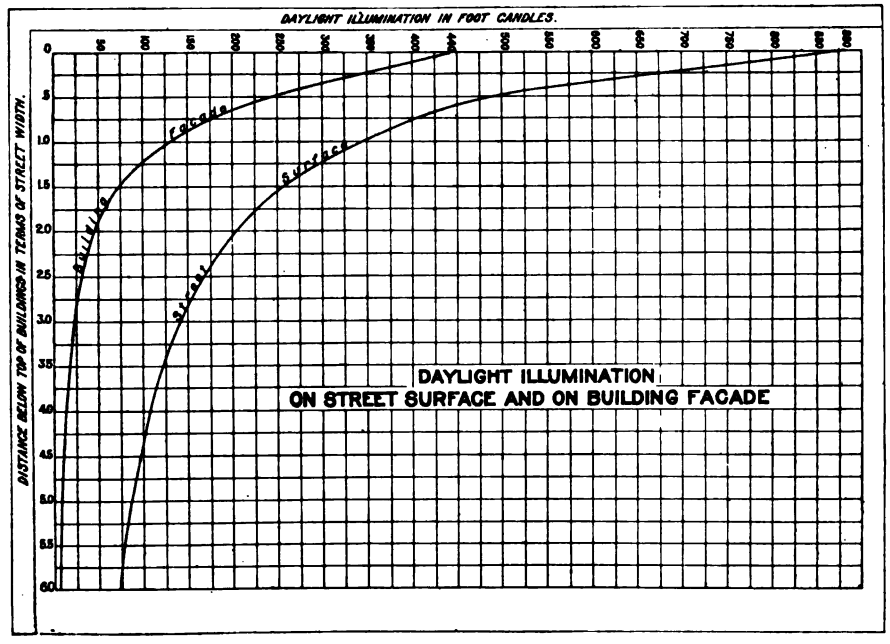

DAYLIGHT ILLUMINATION IN FOOT CANDLES.
DISTANCE BELOW TOP OF BUILDINGS IN TERMS OF STREET WIDTH.
facade
surface
DAYLIGHT ILLUMINATION
ON STREET SURFACE AND ON BUILDING FACADE

FIG. 60.

square foot and the corresponding working minimum 280 candles per square foot. The illumination received at an unobstructed point on the surface of the earth is 880 foot candles. The illumination on the side of a building at the ground level where half of the sky is obstructed is 440 foot candles.

Illumination on street

Increasing the height of buildings reduces the amount of daylight falling on both the street level and the street facade. A street improved with buildings once the street width in height receives only 71 per cent as much illumination from the sky at the curb level as one improved with buildings half the street width in height. For a street improved with buildings twice the street width in height the direct illumination from the sky is only 42 per cent; thrice the street width, 29 per cent; four times, 22 per cent; five times, 18 per cent; and six times, 15 per cent.

Illumination on street facade

The illumination on the street facade diminishes even more rapidly with an increased height of buildings than that at the street surface. A point on the facade once the street width below the top of the opposite buildings receives only 53 per cent as much direct daylight illumination as one situated half that distance down from the top. At a point twice the street width below the top of the opposite buildings across the street the illumination is only 19.2 per cent of that one-half times the street width down from the top; three times the street width, 9.4 per cent; four times, 5.5 per cent; five times, 3.5 per cent; and six times, 2.5 per cent.

The illumination in foot candles in the street and on the street facade due to direct skylight is shown in the following table for different points below the top of the buildings assuming the street in each case to be uniformly improved on both sides with buildings of different heights. The curve in Figure 60 presents this data in graphic form.

Height of Buildings Times Street Width	Foot Candles	
	On Street Level	On Street Facade
0	880.	440.
½	486.8	243.3
1	345.2	128.9
1¼	296.4	96.5
1½	258.1	73.9
2	204.0	46.6
2½	167.5	31.6
3	141.6	22.9
4	107.7	13.2
5	86.6	8.6
6	72.5	6.2

Illumination in inner courts

The minimum size prescribed by the Tenement House Law for an inner court on the lot line in a tenement 60 feet high is 12 feet by 24 feet. The law contemplates that this court should be complemented by a court of similar size on the adjacent lot, but it does not enforce this provision. Let us assume that the adjoining building when erected does not have its courts

co-ordinated with those on the lot considered. Then if this building is also 60 feet high, our tenement, which is once the width of the street if built on a 60-foot street is served by a court only half as large as that contemplated by the law. In that event the direct illumination obtained from the sky at the bottom of the center portion of the side wall is only 2.1 foot candles while that at the center portion of the end wall is only 3.8 foot candles. The street facade, assuming the street to be uniformly improved with 60-foot buildings, receives at the bottom 128 foot candles. In other words the direct illumination received at the bottom of the court is only from one and one-half to three per cent of that received at the corresponding point on the front facade of the tenement.

Assume that the complementary court 12 feet by 24 feet is provided on the adjoining lot, making a combined court 24 feet by 24 feet, the direct illumination at the bottom of the wall would still be only 7.5 candles or 5.8 per cent of that obtained at the bottom of the street facade.

The direct daylight illumination obtained in an inner court the length of which is twice its width and the height of which is expressed in multiples of its width is stated in the following table. The illumination given is that received on a vertical surface at the bottom of the court wall half way between its ends.

Height in Terms of Width of Court	Illumination in Foot Candles	
	On End Wall	On Side Wall
1	103.9	109.9
2	34.3	25.9
3	14.2	9.0
4	7.0	4.0
5	3.8	2.1
6	2.3	1.2

Daylight entering windows

The quantity of daylight entering an ordinary front window is between 40 and 75 per cent of that falling on the street facade. From 25 to 60 per cent of the daylight received by the facade is cut off from penetrating into the rooms by the frame in which the window is set. This is the situation with an unobstructed window. If there are buildings on the other side of the street opposite the window the percentage of daylight received by the room is, of course, much smaller, the exact amount depending upon the height of the obstructing buildings.

Barring obstructions, it is the size of a window with reference to the thickness of the wall in which it is set that determines the amount of daylight admitted into a room. A small window in a thick wall admits proportionately less daylight than a large window in a thick wall. Thus an unobstructed window two feet wide and four feet high set in a wall one foot thick has 53 per cent of its light cut off by the thickness of the wall while a window twice as large, four feet wide and four feet high, set in a wall one foot thick, has only 40 per cent of its light cut off by the thickness of the wall. For an unobstructed window of a given size the proportion of the daylight received which passes through the window diminishes with the

thickness of the wall. For a given thickness of wall it increases with the height and width of the window.

In all the calculations relating to the amount of daylight entering windows in this paper it has been assumed that the window pane would fill the entire window opening.

In an unobstructed window two and one-half feet wide and six feet high set in a wall one foot thick the flux of daylight admitted is equal to only 76.1 per cent of that through a window set in a wall one-half foot thick. If obstructed by buildings on the opposite side of the street one-half times the width of the intervening space in height the window set in the one-foot wall would admit only 71.6 per cent as much daylight as the one set in the half-foot wall. For obstructing buildings different times the street width in height above the level of the window the amount of daylight received by a window set in a one-foot wall as compared with that in a half-foot wall would be as follows: one times the street width, 65.6 per cent; one and one-quarter times, 61.6 per cent; one and one-half times, 59 per cent; two times, 52.2 per cent; two and one-half times, 45.3 per cent; three times, 34.3 per cent; and four times, 18.7 per cent.

The curve in Figure 61 shows that obstructing buildings are more detrimental to the lighting of rooms than the thickness of walls. Inordinately thick walls cut off a considerable portion of the direct daylight, but excessively high buildings cut off more.

An unobstructed window receives some direct light even though it is set in an extremely thick wall but a window set in a comparatively thin wall receives absolutely no direct skylight illumination when obstructed by a high building. The exact point at which all such illumination is eclipsed depends upon the thickness of the wall in relation to the height of the obstructing buildings. Thus, a small window say two feet wide and four feet high set in a one-foot wall receives absolutely no skylight if situated at a distance three times the street width below the top of the opposite buildings. A window two and one-half feet wide, six feet high and set in a wall of the same thickness on the other hand receives direct illumination from the sky even though it is situated four times the street width below the top of the opposite buildings. This latter window if placed in a wall one-half foot thick would receive some direct light even at a point six times the street width below the top of obstructing buildings.

The following table shows the flux of daylight in foot candles per square foot admitted by a window two and one-half feet wide and six feet high when set in a wall of different thicknesses and obstructed by buildings of different heights:

Thickness of Wall in Feet	Height of Obstructing Building in Terms of Street Width				
	None	One-Half	Once	One and One-Half	Twice
0	6,600	3,649	1,933	1,110	699
½	4,976	1,440	375	114	41
1	3,784	1,029	246	68	21
2	2,280	540	102	20	3
3	1,485	299	54	3	0

In all of these calculations only the direct illumination obtained from the sky has been considered. The actual illumination in any particular case exceeds that stated here on account of the reflected light received. When

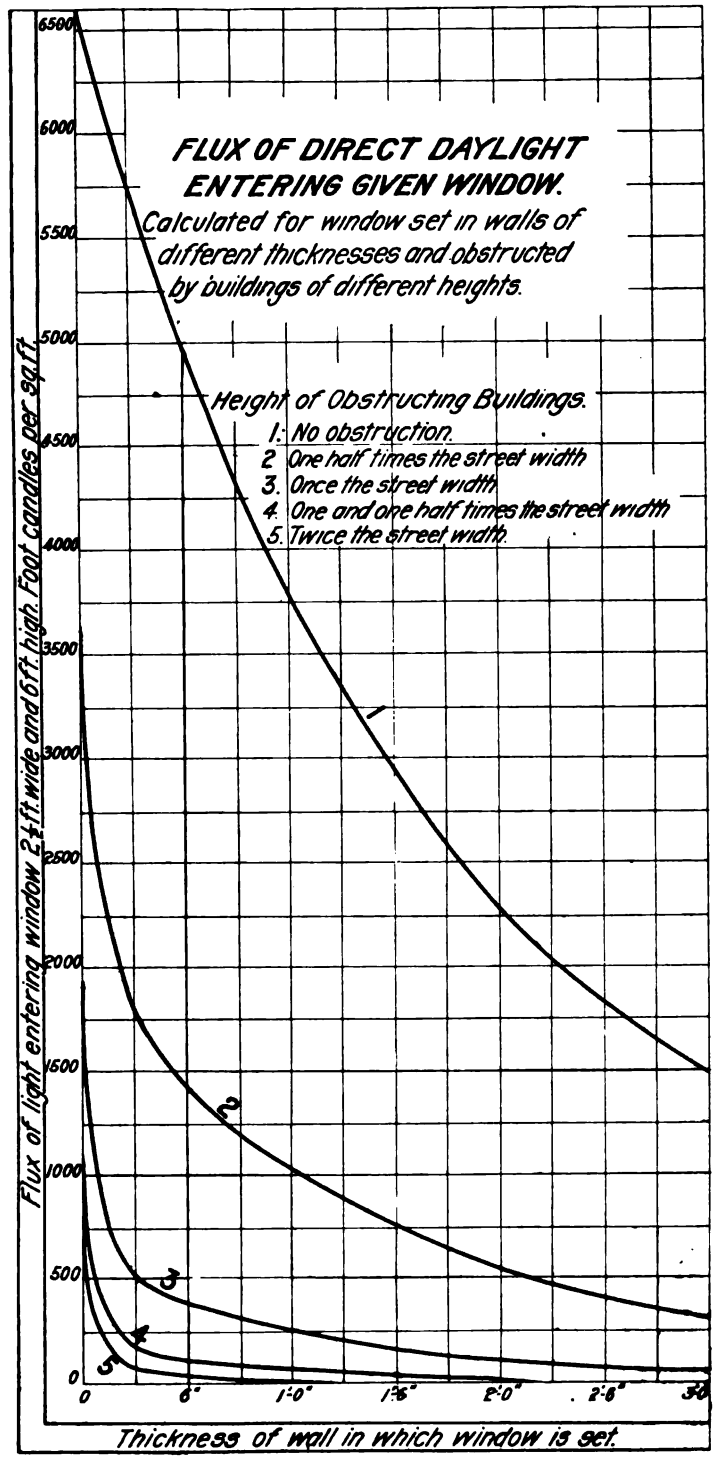

FLUX OF DIRECT DAYLIGHT ENTERING GIVEN WINDOW.
Calculated for window set in walls of different thicknesses and obstructed by buildings of different heights.
Height of Obstructing Buildings.
1. No obstruction.
2. One half times the street width
3. Once the street width
4. One and one half times the street width
5. Twice the street width.
Flux of light entering window 2½ ft. wide and 6 ft. high. Foot candles per sq. ft.
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
6"
1'-0"
1'-6"
2'-0"
2'-6"
3'-0"
Thickness of wall in which window is set.

FIG. 61.

the walls are light in color the reflected light is a considerable part of the total illumination. The importance of light colored walls in the daylight illumination of buildings cannot be too strongly emphasized.

STATEMENT BY HERBERT S. SWAN, EXPERT INVESTIGATOR, COMMITTEE ON CITY PLAN, MAY 19, 1916

Relation of high buildings to street congestion

Buildings in the downtown section of Manhattan have been erected without any reference to the street width. The average frontage height on Trinity Place and Church Street, between Morris and Chambers, is 9.18 stories; on Nassau Street, between Wall and Frankfort, 9.21 stories; on New Street, 12.24 stories; on Broadway, below Chambers, 13.92 stories; and on Exchange Place, 14.90 stories. On Trinity Place and Church Street this is 1.8 times the average street width; on Broadway, 2.5 times; on Nassau Street, 3.0 times; on New Street, 4.6 times, and on Exchange Place, 5.6 times.

The effect of these extreme heights is to render the street width absolutely inadequate to care for the traffic accompanying such heights.

The ordinary lot in New York is 100 feet deep. The average net rentable floor space per occupant in an office building is about 75 square feet. The approximate number of occupants on any given street, assuming the street to be used entirely for office purposes with a rentability of 100 per cent may be ascertained by using these factors in connection with the average frontage height in stories. Proper allowance must, of course, be made for the progressive diminution of net rentable floor area accompanying each increment in height.

To make one street comparable with another, proper allowance must also be made for any space occupied by parks, public spaces, public buildings, churches and cemeteries. In making these estimates, the portion of the street frontage devoted to such purposes has been deducted from the total frontage. The street intersections have, however, been regarded as belonging exclusively to the street under consideration in each case. These might more appropriately have been apportioned between the particular street under consideration and its bisecting streets, but the difficulty encountered in doing this made it infeasible. Each street is considered as a unit. The inclusion of the street intersections makes the congestion appear smaller than is actually the fact.

Estimated on this basis, New Street has at present an office population of 16,952; Exchange Place, 18,401; Nassau Street, 26,109; Trinity Place and Church Street, 37,702, and Broadway, below Chambers Street, 55,540. The total office population of these five streets is 154,704.

What the office population on these five streets would be at different average frontage heights may be summarized as follows:

Height in Stories	Nassau Street	Trinity Place and Church Street	New Street	Broadway, Below Chambers Street	Exchange Place	Total Population	Increase Over Present Population
15	40,230	58,080	20,415	59,580	18,525	196,830	42,126
20	51,960	75,000	26,360	76,940	23,980	254,240	99,536
25	62,525	90,275	31,725	92,625	28,875	306,025	151,323
30	72,150	104,190	36,630	106,860	33,330	353,160	201,840

The investigation shows that it would be impossible for all the occupants of the buildings abutting on these streets to seek the street level at one time, since the street—even though it were cleared of all other traffic, pedestrian, vehicular and surface street car, and absolutely free from all obstructions so that the entire width of the street might be used—would be unable to hold them. The minimum space required by a crowd moving in one direction is five square feet per person. Computed in this manner, Broadway could hold but 96.3 per cent of its occupants; Trinity Place and Church Street, 86.6 per cent; Nassau Street, 69.3 per cent; New Street, 44.5 per cent, and Exchange Place, 37.5 per cent.

Stated in other words, the crowd on Broadway, below Chambers Street, would be 1.1 persons deep; on Trinity Place and Church Street, 1.2 persons deep; on Nassau Street, 1.4 persons deep; on New Street, 2.2 persons deep, and on Exchange Place, 2.7 persons deep. New Street and Exchange Place, it will be noted, would barely afford adequate standing room for their respective occupants.

For practical purposes, however, the street must be divided into roadway and sidewalks. The entire street cannot be used exclusively by pedestrians; it must be used by both pedestrians and vehicles.

If the crowds were to keep on the sidewalks, moving in one direction as above with a minimum space allowance of five square feet per person, the occupants on Trinity Place and Church Street would be piled up 1.8 persons deep; on Broadway, 2.0 persons deep; on Nassau Street, 3.1 persons deep; on New Street, 5.2 persons deep; and on Exchange Place, 6.6 persons deep.

If the average frontage height on these streets were increased to 30 stories, the occupants would be piled up 4.0 persons deep on the sidewalks on Broadway, below Chambers Street; 5.1 persons on Trinity Place and Church Street; 8.5 persons on Nassau Street; 11.4 persons on New Street; and 11.9 persons on Exchange Place. These estimates are based on the assumption that the sidewalk width would remain unchanged. The following table shows the estimated sidewalk congestion on these streets if improved with buildings of different average frontage heights, the figures showing the number of persons deep the occupants would be on the sidewalk, each occupant being allowed five square feet of sidewalk space:

Height in Stories	Nassau Street	Trinity Place and Church Street	New Street	Broadway, Below Chambers Street	Exchange Place
15	4.8	2.8	6.3	2.2	6.7
20	6.2	3.7	8.1	2.8	8.6
25	7.4	4.4	9.6	3.4	10.4
30	8.5	5.1	11.4	4.0	11.9

The sidewalks are incapable of caring for more than 56 per cent of the present office population on Trinity Place and Church Street; 50 per cent on Broadway; 32 per cent on Nassau Street; 19 per cent on New Street, and 15 per cent on Exchange Place. If the buildings on these streets were increased to a uniform height of 30 stories, then the sidewalks on Broadway would afford sufficient space for but 26 per cent of the occupants; 20 per cent on Trinity Place and Church Street; 11.9 per cent on Nassau Street; 8.9 per cent on New Street, and 8.4 per cent on Exchange Place.

Statement by Daniel L. Turner, Deputy Engineer of Subway Construction, Public Service Commission, First District,* May 11, 1916

Increase in subway congestion

The subway was originally expected to develop a traffic of from 400,000 to 500,000 passengers per day. It commenced operation the latter part of 1904, and carried 72,723,000 passengers in 1905.

The next year, 1906, the traffic had increased to 137,917,000 passengers. That is practically double, an increase of 100 per cent within one year after operation. This increase was contrary to the expectations of a great many who felt that embarking upon subway construction was a hazard from a financial standpoint for the reason that people would object very seriously to riding underground in subway lines. It was thought that the business would be very slow in developing. On the contrary, the growth was astounding.

The figures constantly increased of course, but not at such a rate of increase as in the first year of operation until we are now carrying 345,-586,000 people a year. That is an average of very nearly a million a day. Of course, the business during the year has fluctuated exceedingly. There is a daily fluctuation in business. I will speak of that later on. There is a monthly fluctuation in business dependent upon traffic conditions. At the busiest time of the year, around the holiday season, in December, the number of passengers carried per day is over a million and sometimes nearly a million and a half per day.

The exceedingly rapid development of business and the popularity of subway travel is indicated when you consider the fact that all the elevated lines in Manhattan, that is, the Second, Third, Sixth and Ninth Avenue lines, in 1915, only carried 301,793,000 people, as against 345,586,000 for the subway. The subway is now carrying more passengers per year than all of the four elevated lines in Manhattan combined.

Another comparison that is interesting is that in 1905, the first year the subway was in operation the several elevated lines in Manhattan carried in round figures 266,000,000 passengers, as against 73,000,000 passengers on the subway. In the period which has since elapsed the number of passengers carried on elevated lines has increased from 266,000,000 to 302,000,-000 per year, whereas the number of passengers carried in the subway has increased from 73,000,000 to 346,000,000 per year.

This tremendous increase has been taken care of without any increase in the number of lines, simply by increasing the length of the trains and decreasing the train intervals. The schedule at the start was two minutes for the express service. Now the schedule for the express service has been reduced to one minute and forty seconds. Besides this considerable decrease in the interval there has been an increase in the length of trains—the express service has been increased from eight to ten cars for each train. Of course, overloading has increased enormously. At the beginning there was an overloaded condition, but it was nothing comparable to the overloading that is carried now. I have known counts to be made in subway cars, carrying close to 200 passengers. We figure as a rule about 125 persons to a car as the number for a load, whereas the seating capacity is a little under fifty—we put it at fifty. The seats are nineteen inches wide. The 1914

* This statement has been compiled from answers made to questions asked Mr. Turner.

increase in the 181st Street station business over 1913 is 385,000 passengers. The total business at that station during 1914 was 6,133,000. That is an average of about 18,000 a day. I count 340 days to a year. During 1913 it was 16,000 a day, 1912, 14,000, 1911, 12,000. This is an increase of 50 per cent in three years. This is a station where the only means of getting to the surface from the subway platform is by elevators. The unusually large business at 181st Street is due to the extensive building around that point. The same result is bound to come at any point along the route of the rapid transit system if there is any sudden building.

On the Broadway branch from 96th Street north before the subway went into operation there were no rapid transit facilities. There was absolutely no population in that area. The traffic during 1914 on the Broadway branch was 44,000,000 passengers. That is more than 10 per cent of the total business of the whole subway.

The territory traversed was absolutely virgin territory before this rapid transit line was located there. These figures show the tremendous effects that transit facilities have in developing a new section.

If there is no control or regulation over tenement buildings, the distribution of the population which the transit lines are designed to effect will be to a large extent nullified, and the tenements in favored sections will continue to pile up on top of each other.

If there is no control over housing or building regulations such as proposed generally in the program of this Commission the provision of additional transit facilities simply increases congestion. In fact, I would say, just at this particular time that the new rapid transit facilities are about to be opened up, that this is the psychological time for the adoption of a program such as is proposed by this Commission. In fact, if you do not adopt a program such as is proposed by this Commission or a similar one you will lose the benefit of the rapid transit facilities.

Air space per subway passenger

The subway cars are nine feet wide and fifty-one feet in length, including the platforms.

The height of the subway cars is twelve feet above the base of the rail. The body of the car is about eight feet high. These dimensions give the subway car a cubic content of approximately 3,672 cubic feet. Counting 200 passengers to the car each person would have an air space of eighteen and a half cubic feet.

Standard for limiting subway congestion

My theory is that rapid transit lines, or any municipal transit lines, ought to be permitted a capacity at the rush hour, of about fifty per cent over the seating capacity. The rush hour of course, is not the peak—the peak, where the load is very much in excess of the average for the hour, is fifteen or twenty minutes only in duration. I arrive at this carrying capacity during the rush hour from the standpoint of permitting free circulation in the cars. That has no bearing on the health standpoint. I had a talk with Dr. Emerson, the Commissioner of Health, and he arrived at the same conclusion from the health standpoint—about fifty per cent overload.

You understand that we could not accommodate, or take care of the business of New York on such a basis. We have to carry to business in New York City, over all lines—surface, elevated and subway, somewhere in the neighborhood of half a million people in one direction in one hour.

A seating capacity standard is financially impossible. Neither would it be a physical possibility under present conditions.

Rush hour traffic

The proportion of daily travel in New York during the rush hours is a very variable proposition. The rush hour traffic, that is, the traffic in one hour in one direction past the maximum load point varies all the way from four to five per cent in the subway to twenty per cent on some of the surface lines—of the total daily business in both directions.

I have no doubt that people let three or four trains go by before getting on at the Grand Central Station during the rush hour. You can get comfortably into a train at the Brooklyn Bridge during the rush hours. Everybody at this station bound for a certain destination is able to get into the first train to that destination which arrives. They may not all get a seat, but undoubtedly they all get in. There may be some little waiting at 14th Street. There was a time when 14th Street was simply a swarming mass of people. They frequently had to wait five or six minutes before they could get on a train. Now the waiting has moved up to 42nd Street, in my judgment. This is just a general observation that I am speaking of. I have not had any actual count made.

Average length of time spent in subway

I should not think that the length of the average trip would amount to much more than twenty-five or thirty minutes. I made some careful observations some time ago, and the average ride on the subway was then about five miles. I think it may be a little greater than that now. This average is for the whole day. The average for the rush hour ride would run somewhere around thirty-five to forty minutes. The time spent in the subways by those who travel during the rush hour, therefore, average about eighty minutes per day.

Possible increase in subway capacity

I would not say that the limit has been reached in the present subway with respect to the length or number of trains. I think that the interval may yet be reduced somewhat.

At the peak of the rush our new contracts as a matter of fact, require a minute and a half interval, forty trains an hour. Some of the operators maintain that we are not going to be able to quite accomplish this. From the best evidence that could be obtained, after careful study of the situation, the contracts were drawn to require that the equipment be provided to maintain the necessary speed and that a signal system be provided which would permit that interval. Now if the traffic can be controlled so as not to congest the lines, but can be distributed so that cars are not excessively over-loaded, then station stops will be reasonably short. I believe under such conditions that the 1½-minute interval may be accomplished. That is our feeling anyhow. I know that we could do better in the present subway if we could reduce the time of the stop. The Grand Central station stop which is practically a controlling stop on the present subway runs close to a minute, when really it ought not to be more than half a minute—that stop stalls everything on the line behind. When the subway was originally put into operation the stop then necessary retarded the operation for the reason that the signals did not permit the trains to approach the station because they had to maintain a running distance and the result was that the train in the station got a clear signal to go ahead and the other train not only had to get into the station and stop, but had to travel some distance from behind.

After the congestion became intense the condition was improved by installing the speed control signal which permits a train to come right up, behind the other train, to the station, so that when it does get a clear signal to go ahead it has only a short distance to run into the station. With the signal development of the present time it may be practicable to maintain such operation and thereby decrease the interval between trains.

Districting as a remedy for subway congestion

You not only have to distribute the workers but you have to distribute the places of abode and also distribute the places where they work. This is the prime essential. The difficulty to-day is that one part of New York City is the objective point of so many people. As it stands now, practically everybody wants to go somewhere between 42d Street and the Battery during the peak of the rush. Practically all the lines are built in order to carry people to that one location. I do not think there is any necessity for such a condition.

There ought to be localized business centers surrounded by residential areas, away from the one general center, which would be traversed by those transit lines which connect the outer sections with the general center. There would then be created a two-way traffic movement to such localized centers from the contiguous residential areas.

Unless a very careful housing and districting regulation, such as you are trying to carry out, is adopted, it will be absolutely impossible for the City to cope with its municipal transportation problem. These two problems have got to be taken together. They are absolutely related to each other. We can provide facilities up to a maximum of the street capacity, but we are rapidly coming to the actual capacity of the streets so that housing and manufacturing sites and working sites ought to be controlled with a view to having the population distributed over the whole area and in that way develop a two-way business on all lines to the very utmost.

I think districting is absolutely essential to the transportation problem of this city. That is the only way in which the excessive rush hour congestion can be eliminated.

To illustrate what I have just been saying, the transit plan, as it has been laid down, is to distribute the population throughout the whole city.

It is essential, however, in order that the plan may be effective that there may be some control over housing regulation near the business center, for the reason that if you permit tenements to be piled up near a business center, thereby reducing the ride to twenty minutes or half an hour, people are going to insist in living in these areas rather than going out into the undeveloped and new areas which the rapid transit system has made accessible.

If there were cross-connections between Long Island City and the residence portions of Brooklyn, it would tend to draw factory workers out of Manhattan into the outlying boroughs and make it easy for them to get back and forth to places of work which would not have to be in Manhattan.

I think that the traffic conditions I have pointed out will undoubtedly continue even after the new subways are completed, unless a districting plan is adopted. Unless you have your districting plan or something similar to it carried out, the transit problem of the city will come to such a point that it will be impossible for the city to cope with it.

Anything that would tend to restrict the available factory area in central Manhattan and to increase the residential areas in central Manhattan would undoubtedly tend to decrease excessive congestion on the rapid transit lines, especially if the residential area is located within a short distance. It might intensify congestion if a segregated manufacturing district was more than walking distance from a segregated residential section.

I think that the location of homes within walking distance of workshops is usually the condition abroad which makes the per capita ride so much less. The per capita ride in 1910 on the rapid transit lines was 161, to-day it is 176. The total per capita on all lines in 1910 was 321. To-day it is 358. These are fare passengers. When you consider the transfer riders the figures enormously increase. There is no other intensity of riding comparable with ours anywhere else in the world.

On the average an individual rides 358 times every year. That means practically everybody rides once every day. It is an indication of the intensity of the use of the municipal transit lines which is very much greater than any other lines, simply because of the general conditions that industries are not located near home sections for the workers so that many may walk.

Length of walk from subway stations

The average person will walk about one-quarter of a mile to a rapid transit station. I don't believe that you will get many people to walk half a mile to a station. That is particularly during the rush hour. During non-business hours they will easily walk more. There are very few people compelled to walk more than half a mile in Manhattan or Bronx to get to a station.

Capacity of dual subway system

On the dual system we have doubled transit facilities and by doubling the facilities we have trebled the capacity and this has been done chiefly by utilizing the two-way movement through business centers. I mean by this that the trunk line that is built through a business center has a branch or feeders at both ends of it, so that all trains originating, we will say, in the Bronx in the morning come down town fully loaded, go through the business center, lose their loads, go over to Brooklyn, fill up and come back through the business center again, so that we have a four track trunk line through the congested part of the city where most of the people want to go every track of which is utilized by a fully loaded train.

There are twelve tracks in the existing rapid transit system, five utilized by empty trains and seven by full trains. When I say the existing rapid transit system, I do not mean to include the Brooklyn elevated lines, because they are not city transit lines—they simply serve Brooklyn. They do not bring people through the business center. I mean Manhattan elevated lines and the subway lines. Under the dual system we have increased the capacity to nineteen tracks, five of them empty and fourteen utilized by full trains. In other words, we have doubled the number of full train movements through the business center. We still have a potential capacity for increase by running some more branches to Brooklyn without building hardly another foot of subway through Manhattan.

STATEMENT BY GEORGE C. WHIPPLE, PROFESSOR OF SANITARY ENGINEERING, HARVARD UNIVERSITY, MAY 29, 1916

Building restrictions and the public health

The Commission on Building Districts and Restrictions of New York City, has formulated tentative regulations governing the area and height of buildings which may be erected in different parts of the city and the uses against which the buildings in each district may be restricted. Authority for doing this was granted by the State Legislature. The Legislature has delegated to the Board of Estimate and Apportionment the power to put such regulations into effect. This is clearly an exercise of the police power which resides primarily in the State. The right to so delegate it is unquestionable. It is of vital importance, however, to ascertain whether the proposed regulations do as a matter of fact fall within the proper scope of the police power. This is a matter for the courts to decide, but the decision of the courts should be anticipated as well as possible by considering the relation of the facts to established legal precedents. Do the restrictions of the bulk and the use of buildings in a city like New York materially involve the health, safety or morals of the people? If they do the action comes within the accepted scope of the police power, and is constitutionally sound.

I believe that there is a vital relation between the public health and the buildings in and about which people spend their lives, and I believe that in a city a reasonable restriction of the height, area and use of buildings is a justifiable exercise of the police power.

The proof of this cannot, in the nature of the case, be direct or susceptible of support based on definite experiment. Public health is a matter which is influenced by so many things that it is almost impossible to select one factor and consider its effect apart from all others. The proof of the relation between housing and health must necessarily be axiomatic in character and based upon the accumulated experience of mankind generally expressed. Studies of the statistics of disease and death for people who live or work in buildings of different kinds and under different conditions have been collected by sanitarians in various places in the world, but these lead to no definite conclusion, for the very good reason that housing is only one of the factors, and not the principal factor, which influences disease and death in the community and for the further reason that disease and death are not a complete index of health. Nevertheless the fragmentary statistical studies which have been made point to a relation between housing and health which hygienists and sanitarians have not hesitated to accept.

Health

At the outset it is important to get a full conception of what is meant by health. At the present time public health activities are coming to be dominated by the bacteriologist and epidemiologist. Attention has been focused especially on communicable disease. All the world knows that the efforts of the new public health movement in reducing the suffering and misery of mankind have been the most remarkable in the world's history and must long be continued. The results have been measured in terms of death rates and sickness rates. Naturally enough health has come to be regarded by some as the absence of disease. But that is not a complete conception of health. Health is more than the absence of disease. It is something positive, and involves physique and vitality, and it is mental as

well as physical. The inherent difficulty at the present time is the absence of scientific methods of measuring this positive element in health. Yet the world knows as a matter of human experience that it is real and vital. The expression, "health and comfort of the people," is centuries old, and these two ideas are inseparable.

Public health, of course, is the sum total of the health of the constituent individuals. We measure public health inversely in terms of death-rates because at present we have no means of measuring health-rates. We take a part as an index of the whole.

Fundamental concepts

Light, air, water, food and shelter are essential to life. Modern sanitarians would perhaps qualify this statement by adding the idea of cleanliness, and say that clean air, clean water, clean food and clean human beings are essential to healthy life.

The regulation of buildings is intimately connected with the factors mentioned—light, air, water, food, sanitation—and is therefore itself a factor in public health.

Relation between internal and external conditions

In cities people live an indoor life to a greater extent than they live out-of-doors. During the last fifty years cities have increased greatly in size and indoor life has become correspondingly more common and more important. The advent of steel construction has changed the shape of many buildings, increasing height and producing congestion. It has also had a tendency to reduce the size of rooms and has led to what is termed a cellular type of housing for dwellings and offices.

As far as health is concerned indoor conditions are on the whole more important than outdoor conditions in a city like New York. Indoor conditions are dependent largely upon the plan and construction of buildings and upon occupancy, all of which are well recognized as coming within the control of the police power. But indoor conditions are also and to a large extent controlled by the conditions out-of-doors. It is the outside environmental conditions to which the tentative regulations of the Commission are chiefly directed. The amount of daylight which enters a building depends upon the amount of sunlight which falls upon the exterior, and upon the proximity of other buildings, their height, and their bulk. The amount of air which enters a building is also influenced, and sometimes very greatly, by the surrounding buildings. The purity of the air is likewise affected by outside conditions. Thus while spoken of, and properly so, as the regulation of buildings it is the regulation of the space between buildings which is the object in view, a system of regulations designed to prevent one lot owner from interfering with the light and air required by his neighbor. While in general rights in the use of land are bounded by vertical planes, it must not be forgotten that the sun's rays fall slantingly upon the land while the wind movements are chiefly horizontal. These natural elements are interfered with by excessive high and crowded buildings, hence there are rights in land ownership which extend beyond the vertical planes.

The following are some of the points to be considered in connection with this subject.

Sunlight

The rays of the sun bring light and heat to the earth and both are absolutely necessary to man's existence. Considered from the standpoint

of heat the sun's direct rays are beneficial or prejudicial according to circumstances. Heat is absorbed by walls of brick, stone or concrete, with the consequence that the air near them is heated; heat is also transmitted through building walls to the rooms. In winter this is an advantage in this climate, but in summer it may be a disadvantage. Walls shaded from the direct rays of the sun tend to make houses cooler. In summer this is desirable but in winter undesirable. The direct rays of the sun influence the moisture of the air as well as its temperature. The evaporation of water is increased, but as the capacity of air for holding moisture is also increased by heating the relative humidity may be decreased. At all events the sum total of the effect of sunlight is to raise the sentient temperature, that is, the temperature shown by the wet bulb thermometer. It is this sentient temperature coupled with air movement which affects the health and comfort of human beings.

Sunlight likewise causes movements of the air. This is due to unequal heating in different places. The air currents thus set up are gentle and desirable. Places which never receive the sunlight are more likely than others to contain stagnant air.

Considered from the standpoint of light, the sun's rays profoundly affect the lighting of rooms. This is a matter of common knowledge, but quantitative relations have been shown by many photometer tests made at points located at different distances from windows, and by similar tests made at the windows of different stories in tall buildings the exterior lighting of which is influenced by adjoining buildings. The sun's rays are reflected in various ways from exterior surfaces of buildings so that the exterior conditions materially influence the interior lighting, and the nearer the buildings are together the greater is the importance of this factor.

The sun's rays have an effect on vegetation, as will be mentioned later. Sunlight tends to remove moisture from particles of dust in the air thereby improving a foggy atmosphere. It tends to dry pools of water which might otherwise become breeding spots for mosquitoes. The sun's rays have a marked disinfecting action and prevent the growth of molds and fungi, thereby eliminating odors of certain kinds. They also destroy bacterial life, whether the bacteria are floating in the air, or are attached to the exposed surfaces of pavements, floors, or walls. To the extent to which this occurs the danger of infection from certain disease germs is lessened. Sunlight has both a physiological and a psychological influence on human beings. To these may be added the aesthetic effect of light and shade produced by sunlight. In these various ways sunlight is desirable for the health and comfort of human beings, while the complete absence of sunlight is correspondingly detrimental.

Daylight

By daylight is meant the indirect lighting from the sun, that is, lighting received from the sky or clouds and reflected from various surfaces. While it is possible for human beings to exist without direct sunlight and even without daylight, it is the experience of the race that both sunlight and daylight in sufficient amounts are highly desirable. Daylight is necessary not only for the health and comfort but for economic reasons. Too little light causes eye-strain with its train of physiological disturbances, and decreases the productiveness of work. It unfavorably influences the mental condition. Light promotes cheerfulness, while gloomy rooms depress vitality. Lack of daylight limits the length of the working day in some

industries and increases the amount of artificial light required. Artificial lighting with oil or gas tends to vitiate the air by increasing the carbonic acid and moisture, and even by increasing the poisonous carbonic oxide. Artificial lighting also increases fire risks. Lack of exterior lighting increases the amount of window space required and this in turn decreases the heat loss in buildings in winter. In these and other ways insufficient lighting not only results in inconvenience to human beings, but may be a positive menace to the health, safety and morals of the people. The amount of daylight received in buildings is greatly affected by adjoining buildings, by their positions, their height, and by the character of their walls, both in color and material.

Ventilation

The necessity of adequate ventilation need not be argued, but it is not as fully realized as it should be that the air which enters a building, both in amount and quality, is influenced by the surrounding buildings. If buildings are too close together there is likely to be a stagnation of the air between them. The ventilation of streets, alleys, courts, and interior spaces between buildings is as much a matter of public importance, as the ventilation of rooms is a matter of individual importance. Street ventilation is influenced not only by the orientation of the streets and the prevailing wind movements, but by the height, size, shape and character of buildings, and their distances apart. In cavernous streets there are excessive air currents near the ground, and at times great air movements, especially objectionable in winter. On the other hand, at times of gentle air movements there may be no currents at all near the streets and pavements between high buildings because the friction of the air passing through the narrow channels prevents them. In other words, narrow streets lined with high buildings tend to produce extreme conditions of air movement and both extremes are objectionable. In regulating the size and height of buildings with reference to the streets the city is to a considerable extent controlling street ventilation and the ventilation of courts and interior spaces, and thus indirectly the ventilation of indoor quarters.

Quite as important as the volume of the air taken into buildings, is its cleanliness. One of the difficulties in cities is to obtain proper air inlets for ventilation systems. The amount of smoke and dust, foul odors on the streets, bad smells from buildings, from passing vehicles, from exposed refuse and from other sources are matters properly subject to the control of the health department, but the concentration of dust and smoke and foul odors is greatly influenced by street ventilation. The regulation of buildings is a regulation of the amount of dilution of odors, and is, therefore, a public health factor.

Vegetation

It is becoming more and more recognized that vegetation is very desirable in residential districts for reasons of health and comfort. Vegetation cannot thrive without sunlight and it is a matter of history that the increasing height of buildings has driven out the trees from streets, while the extension of buildings over large percentages of the lot have left little chance for vegetation of any kind. Trees, shrubs, and grass tend to cool the air during hot weather. Trees produce desirable shade, and yet in winter they do not obstruct the sunlight. Trees therefore furnish a shade which is automatically adjustable, increasing when it is most needed and decreasing when objectionable. In this respect the shade of trees differs from the shade of buildings.

The effect of vegetation is local. Trees and grass concentrated in parks cannot take the place of vegetation on streets and individual house lots.

Protection of the senses

In addition to furnishing essential living requirements such as air, light, water and food (the last two not here considered), it is necessary for the health and well being of human beings to have their natural senses properly protected. Sight, sound and smell are all influenced by housing conditions and come within the proper scope of building restrictions. The relation between odors and street ventilation has been mentioned. Sound is likewise influenced by the proximity of buildings to each other, by their height, and by the character of their walls. Large high buildings placed near together greatly increase the amount of noise in the street. Buildings of stone, brick and concrete reflect sound and produce echoes. Wooden buildings are less likely to reflect sound. The character of the pavement is of course an important element. Noise greatly increases fatigue, notably the fatigue of mental workers. It is especially objectionable in residential districts because there it may affect the very young and old, and the infirm, as well as all people during their hours of needed repose.

The importance of outlook, the psychological effect of view, especially sky view, is a matter closely connected with public health. Here again the aesthetic influence of vegetation is important. Nervous diseases in cities are on the increase. The protection of the nerves of the people by preventing offense to the senses is a matter which properly comes within the bounds of public health administration.

Need of districting

It may be argued by some that while all of the foregoing statements are admitted the regulations governing buildings should be general throughout the city and not different for different districts. This, however, is not the case. In a city like New York there must be buildings of different character suited to all sorts of uses, and even in residential buildings there are bound to be differences due to the varying financial ability of the people to provide homes for themselves.

Granted that indoor conditions are more important than outdoor conditions, but to a considerable extent dependent upon them, it is obvious that architects cannot design buildings so as to obtain the best interior conditions unless the exterior conditions are definitely established. Nothing in the history of housing has been more distressing than the objectionable conditions which arise from the changes which take place in entire districts. The residential section of to-day becomes the business section of to-morrow; houses are vainly altered to meet the new conditions, the results being almost always unsatisfactory. Individual houses built to secure the maximum amount of light and air suddenly find their windows blanketed by high walls on adjoining property. Had this been known in advance the original building would have been constructed on different plans. It is so obvious that it need not be emphasized that the more permanent the space between buildings, the better can the architect adapt the interior to the exterior conditions. This is in itself a sufficient justification for the regulation of the height and area of buildings, and for the imposition of different restrictions on different districts.

Residential districts need more severe restrictions than other districts; industrial regions need less severe restrictions than business districts. It is

to be granted that restrictions are needed from the standpoint of residence; it is in the interest of conservation to divide the city into different districts in order that all of the land may be fully used to its proper limit.

But the regulation of the bulk of buildings is not enough. Their use must also be regulated within limits, for the use of buildings also affects the health, morals and safety of the people. The best use cannot be made of any building unless the use which is to be made of adjoining buildings is also known. It is not possible, however, to regulate the use of buildings too minutely, and the divisions suggested by the tentative regulations proposed by the Commission offer a reasonable solution of the problem, namely, restriction of districts to residential, business or industrial uses.

Without going into detail, attention may be called to the fact that the use of buildings in a district may influence the public health, in ways similar to those already mentioned. Certain industries produce smoke, dust, fumes or odors, which are objectionable and which tend to make these industries undesirable in a business or residential district. The nature of the industry or business controls the volume and character of the traffic on sidewalks and streets. It may affect the nature of the pavement required and the noise of vehicles and the odors from the streets; it may also affect the safety of those using the streets. The location of residential, business and industrial areas also influence transportation and the manner of transportation has an influence on public health. Mention might be made of churches, schools, hospitals, public buildings, the relation of business and industrial establishments to the homes of the people, but it would be going too much into detail to pursue the subject further. In many individual instances the public health authorities have been called upon to abate individual nuisances. The tentative regulations proposed by the Commission are directed not to the abatement of nuisances, but to their prevention. While these regulations are likely to have their greatest use in increasing and stabilizing real estate values in the city, a more vital reason for their adoption is that they will enhance the health, safety, comfort and morals of the people.

Congestion

We now come to what from the standpoint of disease transmission is the most important benefit to be derived from a districting of the city; namely, the relief of congestion. If there is any one thing which has been definitely established by the new science of public health it is that communicable diseases spread through a community in proportion to the opportunities for personal contact, or, to be more specific, for the excretions of one person to be conveyed to other persons. This personal contact may occur in the home, in the school, in the place of business, in public conveyances, or on the street, or wherever people meet. Crowding tends to increase opportunities for contact, and overcrowded cars and overcrowded rooms are both objectionable. In proportion as people are divided into groups so that the members of each group do not come in contact with the members of other groups the opportunities for contact are lessened. It is not difficult to see how segregation of industries, with provision for people to live relatively near to the places where they work, will tend to reduce the opportunities for the spread of disease by contact. Districting will therefore tend to prevent the spread of disease.

Data collected

With the assistance of Professor James Ford, of Harvard University, I have collected a large number of references taken from well known

authorities which emphasize and confirm what has been said in regard to the relation between housing and public health. These are so voluminous that it has not seemed best to attempt to include them in this memorandum.

Statement by Frank B. Williams, Chairman, Committee on City Planning, City Club, March 4, 1916

Preservation of residential areas

In the districting of cities, the provisions with regard to residential districts, closely related as they are to human comfort, health and life, are especially important. Districting includes segregation and relation or connection. Thus, residential districts should so far as possible be free from buildings to be devoted to alien and disturbing activities; and there should be such districts within easy reach of all of the business and industrial activities of the city. The entire absence of regulation in this city heretofore has made this problem extremely difficult. Industry and business have "affected" large areas that they have made only slight use of. The problem for your commission therefore has often been to find and "save" residential areas, especially in Manhattan. That this has been your point of view your statements and plans would seem to indicate. It is our belief that in one connection you have not applied your principle as fully as is possible and highly desirable; and it is this matter, to which we have given special attention, that we desire to call to your attention at this time.

Need for protecting parks from business and industry

The preservation of residential areas requires not only that they be made secure from invasion of business and industrial interests, so far as possible; but also that in these residential areas now existing, recreation parks, and elements of a similar nature, not to be replaced if lost, be maintained. This can be done only by restricting, so far as possible, to residential uses the areas immediately surrounding these recreation parks. Thus, not only are the parks saved, but residential areas, in parts of the city much needing them, are kept suitable for residence and made permanent.

This does not mean necessarily that we shall prohibit a certain amount of business occupancy, but it must be subordinated to such an extent that it will not invade and change the character of the district.

There are very few recreation parks in Manhattan. Especially is this true when we compare the number to the total residential area and also to the areas given to such parks in other cities. It therefore seems all the more important to preserve those which we now possess. Under the present conditions the congested areas are not adequately provided for in this respect.

The original expense of providing these various recreation centres was very great. They were created for a definite purpose and need, and experience has shown that their usefulness to the children in a residential district does not extend much beyond one-half mile diameter. The destruction of the residential areas about these parks means that we destroy the actual and the social value of these centers which the city has created at considerable expense.

Business not materially benefitted by parks

We believe that it is generally assumed that property used for business and industrial purposes has a greater value than property used for any but "high grade" residential purposes, and that this thought has dominated

the classification of the areas immediately surrounding these recreation parks. To a certain degree, business and industrial interests have crept in to the very edges of these parks. This assumption that business and industrial values are in these districts higher than residential, has led to the classification of many of these areas adjacent to the parks as either business or industrial. This assumption may well be questioned and it is our belief that if the areas around these parks were intensively developed to the maximum along residential and social lines, that values would be produced which would greatly exceed the values which would come through the use of such property for business or industrial purposes. The park is a material asset from the social standpoint which affects the value of property used for that purpose. The parks do not materially add to the value of property around parks when the same is used merely for business or industrial purposes.

Value of parks harmed by business and industry

Increasing the number of factories and industrial buildings within these neighborhoods decreases the value of these parks through augmenting vehicular traffic in the parks and rendering the parks of very little value. The introduction of these buildings decreases the number of families that can live within a useful radius of the playground. The present state of the tentative plan which classifies the majority of these areas adjacent to the parks and playgrounds as "industrial" directs the development of these areas along unnatural lines and tends to retard, if not prohibit, the full development of these areas for appropriate use and therefore defeats the end sought, namely, of providing for the development of property to a maximum of value.

Parks as social centers

We recognize the limitations under which the Commission is working, that they must not decrease or destroy values. The emphasis seems to have been placed upon an assumed business or industrial value which might eventually accrue in these various districts. It seems to us that the tendency is in quite the opposite direction. Parks have been created for a specific purpose and therefore the emphasis in the plan as a whole should be placed upon conserving this value by conserving that element in the plan for which the parks were created. The actual conditions regarding business and industrial buildings surrounding these playgrounds in most cases is such as to suggest to the Committee that too great a value has been placed upon them and that these areas do not show any appreciable tendency toward a business or industrial development. There is, however, a distinct tendency toward the development around these parks of improved tenements, together with social, religious and educational buildings.

It is this tendency which the Commission should recognize upon the plans and in so doing provide foundations for the development of community centers.

Statement by Frank B. Williams, Chairman, Committee on City Planning, City Club, March 28, 1916

Districting in Germany

In 1913, as official representative of the City of New York, it was my privilege to make an investigation in Germany and Austria of the methods and results of the zone or district system of building regulation in those

countries. In that capacity every facility was given me by city and state officials freely and fully to obtain the official facts and the official point of view. My official mission and unofficial introductions made it easy for me to make the acquaintance of those in private life interested and affected by these governmental regulations and the methods of enforcing them. My knowledge of German, acquired as a boy in Germany, made it possible for me to obtain all available information. I devoted several months to the task. Under the circumstances, I consider it my duty, as well as my privilege, to give this Commission the results of that investigation.

Districting was first introduced into Germany in 1884, and began to come into common use at about 1894. It is now the prevailing system of building regulation throughout Germany and Austria. From these countries the system has spread to Scandinavian countries, to both French and German Switzerland, and to some extent to England, Canada and several of the United States. It is, however, in Germany that this system has prevailed more extensively and for a greater length of time than anywhere else and can best be investigated.

The systems of districting employed in the different cities of Germany and Austria differ in many particulars. In general, however, the principles underlying that districting are the same throughout Germany and Austria.

The official opinion throughout Germany and Austria is universally in favor of districting. This is also the popular opinion. In no city in which it has ever been adopted has there been any attempt to abolish it. Everywhere it is regarded as a proved success.

There were in the cities of Germany and Austria in 1913 many individual groups and organizations of individuals who were keenly alive to their social and financial interests and the effect of the acts of city officials on these interests; and these individuals and organizations were at that time expressing their opinions on these matters with freedom and vigor. It was therefore perfectly possible to become acquainted with all shades and varieties of opinion and all facts relating to this subject. I devoted several months to the task of doing so.

There are many unofficial criticisms of districting methods made in Germany and Austria. These crtiticisms are directed either to its administration, which in some particulars seems to be arbitrary and unjust, or to the location and boundaries of particular districts, or to particular height and area limitations as applied to particular localities. On only one or two occasions did I hear any criticism of the system itself, or of the principles underlying it. These adverse criticisms were those of theoretical students of the subject, and had no general support.

Effect of districting

In my judgment, the Heights of Buildings Commission and the Commission on Building Districts and Restrictions are correct in their statements made in their reports of the probable advantages to the City of New York which will result from the adoption of the districting system and are borne out in them by its results in Germany and Austria. It *does,* in my opinion, lessen congestion in overcrowded Germany; it *does* make city land more useful and valuable; it *does* tend to prevent the useless and costly changes in the character of localities; it *does* stabilize values; it *does* make living conditions more comfortable and convenient and business more economical and efficient.

Conditions in Germany and Austria are no doubt different from con-

ditions in New York; but, after all, there is a general similarity in cities in civilized western countries the world over; and the results of districting in Germany and Austria cannot safely be ignored by us in our effort to decide upon the wisdom of ourselves adopting it, but, on the contrary, these results in these countries where it has had such a thorough trial should be given our careful consideration.

Zone plan based on health and safety

One of the arguments for districting in German cities was the decrease in fire hazard by segregating factories, but more emphasis was laid on greater efficiency and decrease in risks to health. As buildings are much more substantial in Germany than here, the argument for districting on account of diminished risk of fire would apply with much greater force in New York than in Germany.

The districting ordinances in Germany have been passed upon by the courts. In 1894 the question was brought up whether the building police had the right to issue the zoning or districting ordinance for a part of Greater Berlin passed in 1892, and the decision of the court was that the building police had the right to issue that regulation, because it tended to increase the public security and health. It has also been determined that the zoning regulations as they affect the city as a whole must be considered in the decision of the court; that it is not fair to pick out, for instance, the district where the regulations are most severe and pass upon that by itself, the entire plan must be regarded.

Statement by Frank B. Williams, Chairman, Committee on City Planning, City Club, April 11, 1916

Purpose of districting

The City Club has already expressed its hearty approval of the main purposes and principles underlying the work of your Commission in its districting of this city as expressed in your tentative report, and of the application of those principles in the various boroughs as exhibited in your tentative resolutions and the plans carrying them out. In a pioneer endeavor of this magnitude and difficulty it would be most remarkable if there were not mistakes which, if uncorrected, would most seriously mar the finished work. It is because you fully realize this fact that in your many public hearings and private conferences with regard to this huge task you are devoting so much time and such patient attention to criticisms and suggestions. It seems to be the universal feeling that never has there been a commission more hard-working, more patient, more open-minded, or more fair.

It is your hope and belief—indeed the object for which you are working—that the district regulations which you are drawing up and applying shall produce in each of the individual districts of the city a type of development which, when once it has occurred, will of itself render it difficult, if not impossible, to erect types of buildings in these districts alien to that typical development; and therefore make it equally difficult or impossible to change the regulations underlying that development. For this reason any but minor mistakes in these regulations at this time are likely to be irreparable.

Criticism of tentative plan

We believe that there *are* mistakes in your tentative resolutions and plans; but that, fortunately, these mistakes may be remedied, not by radical

changes, but partly by readjustments, partly by logical extensions of your work along the lines already laid down by you. The various detailed criticisms of what you have, in general, so well done are, as we shall show, related parts of a general criticism. That criticism, although applying in different degrees to the districting in all parts of our city, relates specially to its outlying portions, where districting, seemingly easier, is really quite as difficult as in a section already developed, and much more effective and important. Our suggestions, therefore, relate not so much to Manhattan as to the other boroughs.

We wish to express our admiration of your tentative resolutions and plans for districting this city according to use. Little as we have to suggest in this part of your undertaking, we do feel that our criticisms may enable you to carry out this branch of your work more in accord with the general principles you have stated in your report.

Exclusion of industry from business districts

To provide for industry in so far as it is necessary as an incident to business, you suggest that the employment for industrial purposes of (1) twenty-five per cent., or (2) in any event two floors of any building in a business district, be permitted. Unquestionably industry as such with its trucking, its street and sidewalk congestion, its smoke and inevitable noises, is destructive of the essential characteristics and advantages of business districts. We agree with you, however, that, as an incident to business, and to the extent to which it is incidental, industry must be admitted into these districts. We feel that the percentage of permissible industry which you have fixed as incidental is too large and would permit great congestion in business districts. Be that, however, as it may, we think that to allow two floors of industry, no matter how low the building, is a grave mistake. In the central portions of the city where buildings are high, this provision would doubtless have little effect on the type of buildings erected. In the outlying sections, however, factories not perhaps exceeding two stories are commercially possible, and there is no reason to suppose that they would be temporary. Even if they were temporary, they would hinder or lower the character of permanent improvements; if they were permanent, they would create a development totally different from that which your Commission in your wisdom has decided is most advantageous in the district; or else produce that confusion and disorder which it is one of the main purposes of districting by use to prevent. In a word, instead of allowing incidental industry in your business districts, you have allowed industry there pure and simple to the exclusion of business. Nor is this the most serious phase of the matter. Since the business districts are also districts which will be used for residence by many of our citizens of limited means, you have brought intensive industry with all its perils to health and life to the doors of the class most needing protection, because least able to protect itself.

In allowing in all cases two floors of buildings in business districts to be used for industry, your Commission may have been influenced by the calculation that as a rough average, the use of two floors for this purpose in a low building of a given area would produce the same amount of street traffic and congestion as the use of twenty-five per cent in this way in a high building. In so far as the "two-floor" provision would produce the factory pure and simple, instead of permitting merely industry incidental to business, it may be doubted whether this is altogether correct. In any

event traffic is not the chief, much less the only consideration, in districting. If the amount of land that could be or has been tentatively devoted to industry were insufficient for such use, there would be more reason for this provision in spite of the confusion it introduces in business districts. It is, however, the general opinion that your Commission has been unable to confine industry within areas sufficiently limited to avoid those sudden changes which in the past have done us such injury. We therefore ask you to reconsider this provision.

Shops on ground floor of residential buildings

In a former communication to your Commission we have already advocated the creation of a fourth use class—that of shops on the ground floor, with residences above. The employment of this use class, although it does not remove all the objections to the "two-floor" provision, of which we have just been treating, would remove many people from its evil effects. We have also heretofore urged upon you the advisability of placing streets near small parks in the residential use class. With this new classification you will, in many cases where it would be difficult to apply the strictly residential classification, be able to accomplish much the same results. The plans which we have filed with you, showing in detail the present use of buildings near certain typical parks, and the printed information of like nature with regard to many other parks in the several boroughs which we have been glad to furnish you, not only tend strongly to prove the possibility and wisdom of this method of saving and increasing the usefulness of our small parks, but also the expediency of creating and employing this fourth use class in many other parts of the city.

Criticism of tentative height and area provisions

Let us now turn to your tentative height and area limitations. Here again we are in general in hearty accord with you. We feel, however, that here also the failure to remedy certain defects—as may be done without departure from the principles already laid down by yourselves and your predecessors, the Heights of Buildings Commission—would entail grave consequences to the city for all time to come.

Stated briefly, our criticism is that, with the possible exception of Manhattan, your districting in its allowance of height and area is so liberal as to fail to accomplish the results which your report, your entire attitude and the frame work of your plans themselves show that you wish to obtain.

Does not your treatment of Brooklyn clearly illustrate the truth of this statement? For instance, over large areas of Brooklyn you have allowed buildings to be constructed to a height equal to one and one-half times the width of the streets on which they are to be erected. On a typical 60-foot street this is the equivalent of eight or nine stories. But, with the probable exception of the Heights, Park Slope, and perhaps Eastern Parkway, and of course the Borough Hall district, the waterfront and a few other industrial districts, the present development in Brooklyn—always excepting terribly congested Williamsburg, with its six stories—is three or four-story tenements, or one and two-family houses.

It may be true—indeed we are inclined to think it is—that height otherwise excessive may be allowed if in compensation area is sufficiently limited. This, which it would seem that your Commission intended to do, you have not in fact accomplished. For instance, but for Section 19 of your resolutions, which brings in the existing tenement house area limitation of seventy per cent, a five or six-story building in a C district on a 50 by 100 foot lot

might occupy over seventy per cent of the lot, and an eight-story 80-foot building only the fraction of a per cent less than seventy. It is only, therefore, in the case of the fireproof building above eight stories, that your C provisions limit the total area of residential buildings, and in the case of these buildings, the limitation is slight. It must also be remembered that it is not so much the well-to-do tenant of the better class of building with his many comparatively large rooms that needs protection as the poorer man in his five, or perhaps six, story walk up.

Congestion in Brownsville

Again, in your tentative report you say that the D district " is intended generally for one and two-family houses, either singly or in rows. Apartments, however, are not excluded but are handicapped by the restrictions as to percentage of lot that may be occupied and size of yards and courts." This handicap, as provided in your tentative resolutions, is altogether too slight to accomplish the purpose intended. We have calculated that in a D district a five-story tenement may be built covering sixty per cent of the lot, accommodating with 600 square feet each twenty-five families. In Brownsville and East New York, as you know, structures four stories in height, covering seventy per cent. of the lot, housing with 583 square feet of floor space twenty-three families, are being constructed in great numbers. The differences between the proposed and the Brownsville type are dangerously small. If, therefore, there is any efficacy in, or need of, districting and the creation of types of buildings in different districts, and if your Commission desires to accomplish what your tentative report states as your purpose, you will be obliged greatly to change the D provisions.

What we have just stated with regard to C and D districts, and previously with relation to height limitations, was not intended to apply solely in those connections, but to illustrate the amount and character of amendment of your plans, which, after careful study of the wealth of material which you have collected and charted, we so earnestly urge your Commission to make.

Change of the sort we urge involves, however, as land becomes cheaper, and its present use less and less intense, not only the strengthening of your height and area provisions, all along the line and for all the outlying boroughs, but some additions to and extensions of them. This may be done simply by creating districts of the same type as those already suggested, but with severer height and area limitations. A better method would be to establish a somewhat different type of district suited to and made possible by the different conditions.

More stringent restrictions desirable

The types of district which so far you have provided for are, on the whole, much better suited to Manhattan than anywhere else in the city. After the medical and engineering testimony which you received at your hearing Thursday, March 30th, you no doubt feel the urgent need of tightening the restrictions with regard also to Manhattan, if only you are able to see how it may be done. Careful study will surely reveal differences in development and land values sufficient to enable you to rescue parts of upper Manhattan from the B-1½ provisions to which you are about for all time to condemn it. In any event, it seems evident that your present regulations are suited to a typical congested tenement house development such as will no doubt prevail very extensively in Manhattan. We believe that whatever

may be true of Manhattan, such regulations are not necessary in the other boroughs. In Brooklyn, for instance, the single house is holding its own, more land being developed with this type of building each year than with tenements. That the Heights of Buildings Commission believed in providing for rather than preventing types of building other than that of the congested tenement is shown by their suggesting in their report a district in which height should be limited to 50 feet, and another in which it should be restricted to 36 feet, at the street line. These were, of course, mere hints of districts and not fully developed districting provisions; but they at least indicate the point of view that we believe should, and in reality does, prevail in your Commission. There is much cheap land in this great city; there are enormous areas in it which, fortunately, are still undeveloped. There, at least, we can still not only permit but aid our people to do pleasant things, and do them in their own way. There, it is still possible to give people more freedom in the use of their land than seems to have been feasible in the parts subjected to minute codes for areas congested with endless tenements, all much alike. It has been done elsewhere under similar conditions. In Forest Hills, Boston, for instance, are to be found three-story buildings, covering not more than twenty-five per cent. of the lot, furnishing light, air, view, gardens, tennis courts and recreation space of many kinds to all the tenants at a moderate cost. Might not the giving to a land owner of the option in these outlying districts to go up higher than some low limit like 36 feet, if he covered a less proportion of his lot, be one of the many ways which study will reveal of accomplishing a variety of results somewhat like these, if your Commission desires them? In a later memorandum we may be able ourselves to suggest other methods of limiting height and area in most parts of the city which will allow the builder greater freedom without endangering the public welfare. Here, however, as elsewhere it is in the skill, industry and wisdom of your Commission that we are glad to trust.

True principle of districting

To what we have urged in the districting of this city as to height and area, your tentative report contained but one answer, and that is the implication to be found in many parts of it that land the same time distance by the new dual transit system from City Hall should receive the same districting provisions. With any such principle we most emphatically disagree. No such principle, so far as we are aware, has even been suggested before in the history of districting. The true principle, we believe, was stated by the Heights of Buildings Commission in the chapter of its report entitled "Conclusions and Recommendations," as follows:

> "Profiting by past experience, we can do much to safeguard the future. We can prevent the repetition all over the city of conditions and evils now confined to comparatively limited areas. Regulations, however, must be carefully devised so as not to interfere unduly with existing property values.
>
> "The Commission believes that any complete system of height and court restriction necessitates the application of different regulations to different parts of the city. The city should be divided into districts, and the restrictions for each district worked out with reference to the peculiar needs and requirements of that particular district. * * * The blanket restrictions which we have recommended for immediate adoption have, as a matter of fact, been devised with reference to the needs of the downtown office and financial

district—the area of maximum congestion. They have been worked out with a view to securing as much light, air, relief from congestion and safety from fire as is consistent with a proper regard for business requirements and existing land values in this area of maximum congestion. * * * We believe that the needs of each district should be studied in the same way that we have studied the central office and financial district and restrictions worked out that will best serve the peculiar needs of each district."

It is this principle of height and area restriction so stated by the Heights of Buildings Commission as the result of their investigation and deliberation—the principle of the greatest protection against growing and spreading congestion that is consistent with due regard for existing conditions and values, the principle that you have more nearly followed in Manhattan than elsewhere, which we urge you to follow in Brooklyn and the other outlying boroughs. Instead, you are permitting eight and nine stories where three or four now prevail; and the crowded Brownsville tenement where the one and two-family house is now being built, or development has hardly begun: thus allowing at the very outer limits of our great city the typical central Berlin tenement.

Vacant land in city

It may be said that Manhattan congestion is necessary within Manhattan distances from City Hall in order to provide housing within the five-cent transit limit by the new dual subway and elevated system for access to City Hall and its environs. To this there are many answers. There is a vast area still available in Brooklyn, Queens and The Bronx. Surface cars and transfers will provide transportation to these areas as need for them gradually arises. Better still, decentralization of industries essential for so many reasons will develop subsidiary centers. Much of Jersey is still near; or, if local patriotism forbids such a suggestion, Staten Island, almost unoccupied and large enough to hold all New York City, can be brought by subway within twelve minutes of City Hall. Even the land speculator should know by this time that the greedy do not always become rich. If the skyscraper does not pay, why should the use of an excessive proportion of the lot continue to do so in these days when we are beginning to demand light, air, sun and space for outdoor life?

Suggested amendments to tentative plan

These are the principles which with earnestness and full conviction we urge you to follow. For the putting of these principles into effect, we make the following recommendations:

1. The establishment of a fourth use class, to consist of shops, without industry, on the ground floor, with residences above.
2. The application of the residential classification, or the fourth use classification, to streets in the neighborhood of parks, especially the smaller ones.
3. The study of the needs of the small park as a neighborhood center. For instance, the large theatre should be excluded, but not the neighborhood theatre; all the minor public buildings, too, should be allowed.
4. The further study of the problem of the garage, so unpleasant and dangerous near residences, and so destructive of business values on the block front on which it is situated; with a view to excluding the garage so far as possible from these neighborhoods.

5. The abolition of the "two floor" provision with regard to incidental industry in business districts; and the change of the twenty-five percentage to a lesser proportion.

6. In outlying A districts surrounded by C or D districts (insofar as such conditions are actually recommended by you) the provision that residences instead of being subject to B provisions should be governed by C or D regulations; such fact being appropriately indicated by a double letter designation of the district, such as AC or AD.

7. A restudy of upper Manhattan with a view to the establishment there of C or D area districts, and "one time" height districts.

8. The elimination of C districts in Brooklyn, Queens, Richmond, and perhaps The Bronx. The substitution of D districts for most of the B and much of the C districts. The establishment and employment in the remaining parts of these boroughs of districts more restricted than D, or of other types of district, with options and generally greater freedom to the land owner in the use of his land.

9. A change in the height regulation in all of the boroughs except Manhattan, so that most of the territory in "one and one-half times" districts shall be limited to a less height, either the "one-times" or a stricter limitation. The stricter limitation of parts of the "one-times" districts. The establishment for application to outlying territory of other types of district, with options and generally greater freedom to the land owner in the use of his land.

APPENDIX V.—SOME RESULTS OF HAPHAZARD DEVELOPMENT AS RECORDED BY THE CAMERA

The Commission secured for its record several hundred photographs showing the results of unregulated, haphazard city building. A considerable number of these photographs are reproduced in the following pages. The subjects were selected and the photographs taken by Benjamin Lorber of the staff of the Committee on the City Plan. They have been edited for this report by Francis P. Schiavone, also of the staff of the Committee.

The photographs are classified according to their chief features into more than a score of divisions. Certain pictures show typical conditions in residential streets, in business streets and in industrial districts; here each is unmistakably of one class, an appropriate development free from the unfortunate admixture that characterizes most of the other streets depicted.

A series of pictures show the invasion of private house streets by the apartment house. Other pictures show the first or incipient stage of that transformation which in its unregulated ravages has caused such great loss to the city's real estate value, the encroachment of business upon purely residential blocks. Business, however, is not all, for a series of pictures show garages in this stage, another factories, another junk shops. When a business or industry gets a footing, its influence is shown by the conversion of nearby residential buildings into a like use. This is usually done not in line with a sane profitable development but as a desperate move by the property owner to avoid total loss. Practical structural difficulties and the lack of funds usually lead to unsightly and inefficient hybrids.

After such a beginning it is to be expected that one class of use will often oust another entirely, that business will supplant residence and that warehousing and industry will supplant business. This change is not accomplished easily or quickly because buildings often have a long term of usefulness which, while constantly decreasing, may still be sufficient to discourage their demolition. Consequently many streets show factories and tenements side by side, noisy, ill-odorous, overtowering industrial plants that deprive the homes of the poor of the quiet, fresh air, light and safety they so much require. The photographs show factories in private districts as well as among tenements and storage warehouses, lumber and building material yards among both. Most of these photographs show that more regrettable condition—the invasion of residence districts—but a few pictures tell an eloquent story, in crowding "loft-to-let" signs, of the loss that follows when retail and other business has abandoned a district and industry has not yet established itself.

That garages constitute a great problem is evidenced by the number and character of the photographs showing these buildings in private house districts, among apartment buildings and in the most congested tenement streets. A series show also that stables and horseshoeing shops, while not multiplying so rapidly as garages, are even a greater menace to the health of the communities in which they are established.

The congestion of street and sidewalk was a condition that could not escape even the most casual camera but often the very intensity of congestion made a representative photograph impossible. The series show, however, street and sidewalk crowding and obstruction due to business use where goods are stored on the walks and the loading and unloading of trucks hampers vehicles and pedestrians. Garages, stables and horseshoe-

ing establishments are shown to present a grave danger not only in the storage of automobiles in the streets themselves, but especially in their unrestricted use of the sidewalks as grade crossings. Push carts are shown in hundreds upon streets on the lower east side of Manhattan and in The Bronx. Another cause of sidewalk and even street congestion is shown to be the multiplication of tall buildings, both manufacturing and office, in which by the multiplication of floor space it is possible to house many more than can crowd into the street at any one time.

The environment of schools, churches and hospitals is shown to have suffered by the uncontrolled liberty of location that has been enjoyed by business and industry and as a great indictment against this very freedom are pictured the hundreds and thousands of children whose only playground is the street.

Most of the photographs relate principally to the Use restrictions, but one interesting series shows the old practice of opening windows upon the lot lines.

A study of the pictures will reveal the fact that although they have of necessity been placed in certain classes, they each contain a comprehensive indictment of the present lack of common sense regulation and a demand for such a remedy as the use, height and area districting proposes to offer.

East 12th Street, Between Avenues C and D—Gas tanks, stable and purifying house in tenement district.

West 66th Street and Amsterdam Avenue—Gas tanks in tenement house district.

East 14th Street, Between Avenues B and C—Gas tanks next and opposite to tenements. Note tenement children playing near them.

FIG. 62—THE ENVIRONMENT OF THE HOME.

The Commission believes that the environment of the home should be guarded and protected in every possible way.

East 112th Street, west of Lexington—Lumber yard next to tenement.

Arthur Avenue, between 178th and 179th Streets—Lumber yard among private houses.

East 14th Street—Building materials yard near tenements.

263 Avenue C—Building materials yard near tenement.

FIG. 63—THE ENVIRONMENT OF THE HOME.

A lumber yard next to a tenement is a menace to public safety by reason of increased fire hazard.

East 22nd Street—Milk station near tenements. Note wagon entering station.

Waverly Avenue, Brooklyn—Milk wagons waiting outside of bottling establishment.

Madison Street—Bottling establishment near tenements.

FIG. 64—NOISE AND THE HOME.

The noise and confusion always more or less in evidence in congested sections are bad even under the best conditions, but when aggravated by heavy trucking in the streets and by the machinery of nearby factories they become a serious menace. When these noises continue throughout the night, as in the case of public garages, ice plants and milk bottling and distributing stations, the evil is enormously increased.

Clermont Avenue, Brooklyn—Milk station details.

Clermont Avenue, Brooklyn—Front of milk station.

Adelphi Street, Brooklyn—Rear of the milk station shown above. Loading and unloading of trucks is done here. The assessed value of land per front foot is $100 in this block, while in the block immediately north the assessed value is $175 per front foot.

FIG. 65—NOISE AND THE HOME.

These three photographs of the same milk station show it to be a large industrial plant. This fact added to its stable character constitutes a strong argument for its exclusion from a business or residence district.

525 East 11th Street—Stable near tenements.

Ludlow Street, between Houston and Stanton Streets—Stables near tenements.

Thompson Street, south from Bleecker Street—Stable near tenements.

FIG. 66—STABLES IN CONGESTED TENEMENT STREETS.

The congested tenement districts, noted for the number of children who must play in the street, are the most inappropriate location for stables.

413 East 10th Street—Stables near tenements. Note condition of sidewalk.

East 12th Street, between Avenue A and First Avenue—Stable next to tenements and opposite children's playground.

312 East 102nd Street—Stable near tenements.

FIG. 67—STABLES IN CONGESTED TENEMENT STREETS.

Church Avenue and Buckingham Road—Garages back up on a fine residence district.

Clarendon Road, near Flatbush Avenue—Garage next to private homes. Note the kindred industry, vulcanizing, nearby.

Ocean Parkway, corner Sherman Street—Garage in the midst of private homes.

FIG. 68—GARAGES AMONG PRIVATE HOMES.

East 23rd Street, between Avenue D and Clarendon Road—Garage next to private houses.

1191 Bedford Avenue—Garage near private homes.

Halsey Street, east of Bedford Avenue Brooklyn — The homes on the right conceal a one-story garage occupying 8 city lots in the interior of the block.

FIG. 69—GARAGES AMONG PRIVATE HOMES.

65 West 118th Street—Garage in a tenement house street.

East 2nd Street, between First and Second Avenues—Five-story garage near tenements and a church, and opposite the LaSalle Academy.

West 90th Street, near Amsterdam Avenue—Garage, storage warehouse and stable in a block of tenements.

FIG. 70—GARAGES IN CONGESTED TENEMENT STREETS.

The injustice of locating a garage in a tenement district where it is a nuisance and a danger is heightened by the fact that the users of the garage are very seldom residents of the tenements.

West 124th Street, opposite Mt. Morris Park — Garage between high-class apartment houses and private houses. Note the public library nearby and the pigeon coop atop the garage.

Park Avenue and 59th to 60th Streets—Five-story garage next to a million dollar apartment house 12 stories high.

Cathedral Parkway, near Seventh Avenue—Garage opposite Central Park and in a high-class apartment house district.

FIG. 71—GARAGES IN APARTMENT HOUSE STREETS.

The City's powerlessness against the garage and stable nuisance is nowhere better illustrated than in the high-class apartment districts, where although values are greatest, rents highest, and residents best able to protect themselves, no effective defense has been found.

East Houston Street, corner of Columbia Street—Motor and horse drawn moving vans lined up in the street.

East Houston Street, near Columbia Street—The hitching up is not done inside the stable but on the street.

East 9th Street, between Second and Third Avenues—Autos lined up along the curb.

FIG. 72—ROADWAY OBSTRUCTION INCIDENT TO STABLE AND GARAGE USE.

Streets in the neighborhood of stables and garages are seldom free from obstruction and congestion. In many cases the street becomes a hitching and storage yard and a place for washing vehicles. Such conditions are intolerable in business and residence districts.

Cumberland Street—Garages, stables, etc.

Mangin Street, near Rivington Street—Tenements in a stable street.

Clermont Avenue, near Fulton Street—Milk station, garage, stables, tenements. The assessed value of the land per front foot is $125, while in the residence block immediately north the assessed value is $175 per front foot.

FIG. 73—STABLE AND GARAGE BLOCKS.

These blocks, having already been invaded and blighted, offer the least objectionable location for future garages and stables. New garages and stables should not be allowed to go into the residence or business blocks as yet unspoiled.

East 3rd Street, near Avenue D—The danger from fire is ever present in stables. Twenty-four horses were burnt in this one.

East 173rd Street, near Washington Avenue—The nearby private homes were flooded in order to protect them from the fire in this stable, where 68 horses were burned.

Houston Street, corner Crosby Street—This loft building fire endangered the adjacent tenement on Crosby Street.

FIG. 74—HOMES EXPOSED TO INCREASED FIRE DANGERS.

Eldridge Street, near Delancey Street—Scrap iron piled nearly as high as the third story of an adjacent tenement.

112th Street, west of Lexington Avenue—Junk shop in an extension of residence.

East 112th Street and Park Avenue—Wagon storage, poultry market, junk shop and horseshoer.

FIG. 75—JUNK SHOPS IN CONGESTED TENEMENT STREETS.

No restrictions are placed upon the location of junk shops or junk yards, and every vacant lot is a potential nuisance. Junk is one form of a city's refuse and should not be stored near residences while awaiting ultimate disposal.

Minetta Street—Chiefly residential but one-quarter abandoned to rag storage.

Chrystie Street, near Hester Street—Junk shop next to tenements.

(Newspaper Clipping)

Junk Pile on Westchester Avenue is a Nuisance

The Board of Health has been appealed to regarding the nuisance at the southwest corner of Westchester and Trinity Aves., where a junk shop litters the sidewalk and street for half a block. At times bales of paper are piled high on the edge of the sidewalk, and in and out of these large rats have been seen running.

The women of the neighborhood are afraid to pass on that side of the street. The shop is in a row of shanties in which a fire recently occurred, and the smell from the burned structures mixing with that of the junk collected there is anything but pleasant.

East 6th Street, between Second and Third Avenues—Junk and rag picking.

FIG. 76—JUNK SHOPS IN CONGESTED TENEMENT DISTRICTS.

Junk shops seemingly cannot be confined within their lots or buildings, but overflow on to the sidewalk and store their refuse on trucks in the street.

East 75th Street, between Third and Lexington Avenues—Horseshoer in basement of tenement house. The team mate of this horse is in being shod.

Stanton Street, between Ridge and Attorney Streets — Horseshoer, wheelwright and coal yard next to tenement.

East 11th Street, between Avenue A and Avenue B — Horseshoer in tenement house.

FIG. 77—HORSESHOEING IN CONGESTED TENEMENT STREETS.

The fire hazard in tenements is not decreased when a forge is placed in its lowest story or in an adjacent building.

West 121st Street and Lenox Avenue. Sign—"For Rent for Business Purposes."

On West End Avenue among fine residences and opposite the Belnord Apartments.

Lenox Avenue, between West 121st and 122nd Streets—Funeral director in a row of private houses.

FIG. 78—STORES INVADING RESIDENCE STREETS.

Business creeps in stealthily unless prevented by Law. Economic conditions are no safeguard against the perversity and foolishness of the occasional owner.

477 Central Park West—Tailor in high-class apartment house.

No. 989 Bedford Avenue, Brooklyn.

Central Park West and 98th Street—Loft building and carpet cleaning works.

FIG. 79—STORES INVADING RESIDENCE STREETS.

Even the most valuable apartment sections where rentals are dependent upon the maintenance of high-class residential conditions have been unable to prevent the damaging inroads of business and industry.

Lee Avenue and Keap Street—Conversion for business.

Lee Avenue, corner of Keap Street—Stores in residence district.

West 8th Street—Basement of private house converted into public laundry.

West 8th Street, between Fifth and Sixth Avenues—Conversion into stores.

FIG. 80—STORES INVADING RESIDENCE STREETS.

The English-basement or high-stoop type of residence is so easily converted into stores that it is almost an invitation for business to invade residence streets.

Hillside Avenue, Jamaica —Antique furniture shop in private house.

26 Herriman Avenue, Jamaica—Undertaking establishment in a private house.

Regent Place, between Flatbush Avenue and East 21st Street, Flatbush—Photo studio in a private house. (This condition is aggravated by the building of a one-story studio extension in the rear.)

FIG. 81—STORES INVADING RESIDENCE STREETS.

Bathgate Avenue, Bronx—Private house having a one-story store extension.

181st Street, corner of Park Avenue, Bronx —One-story extension in residential block.

Bathgate Avenue, Bronx —Private houses converted into extremely cheap stores.

FIG. 82—PARTIAL CONVERSION OF DWELLING TO BUSINESS USE.

Where business has once secured a foothold in a residence district, there is little to prevent that wasteful condition in which buildings are half converted—undesirable as homes and unprofitable as stores.

East 10th Street, west of Third Avenue—Converted private houses.

188 Suffolk Street—Upholsterer in basement of private house.

East 22nd Street, west of Fourth Avenue—Private house district invaded by business and industry.

FIG. 83—RESIDENTIAL BLOCKS INVADED BEYOND RECOVERY.

When one of a row of residences has been converted for business its neighbors are usually forced to follow suit.

East 43rd Street, near Madison Avenue—Retail grocery.

West 23rd Street, between Fifth and Sixth Avenues—Retail furniture.

129 East Broadway—Retail paper.

Avenue A, near 3rd Street—Retail furniture.

FIG. 84—SIDEWALK OBSTRUCTIONS INCIDENT TO BUSINESS USE.

The zone plan in excluding business as a class from residence districts takes into account that many kinds of business, especially of the wholesale and warehousing type, find it necessary to appropriate the sidewalk in loading and unloading and for temporary storage. This is a source of great inconvenience and danger to pedestrians and should not be permitted in a residence section. Such businesses are ordinarily segregated in the exclusively wholesale sections and where this is the case the evil incident to sidewalk obstruction is reduced to a minimum.

East Broadway—Express office.

East Broadway, near Market Street—Wholesale drygoods.

East Broadway, near Essex Street—Wholesale herring store.

Attorney Street, between Houston and Stanton Streets — Wholesale fruit dealers.

FIG. 85—SIDEWALK OBSTRUCTIONS INCIDENT TO BUSINESS USE.

Hudson Street, corner of Duane Street.

First Avenue, near 102nd Street.

East 102nd Street, near First Avenue—Wholesale fruit and vegetables near tenements.

41st Street, near Sixth Avenue—Pianos.

FIG. 86—SIDEWALK OBSTRUCTIONS INCIDENT TO BUSINESS USE.

Fifth Avenue, between 21st and 22nd Streets.

17th Street and Fourth Avenue.

120 East Broadway—Wholesale underwear.

West 23rd Street—Wholesale cut glass.

FIG. 87—SIDEWALK OBSTRUCTIONS INCIDENT TO BUSINESS USE.

90 East Broadway—Wholesale drygoods.

Attorney Street, between Stanton and Houston Streets—Wholesale fruit dealers.

East 2nd Street, between Avenues C and D—Wholesale grocer.

FIG. 88—SIDEWALK OBSTRUCTIONS INCIDENT TO BUSINESS USE.

Gimbel Brothers.

John Wanamaker.

Gimbel Brothers.

R. H. Macy & Co.

FIG. 89—SIDEWALK OBSTRUCTIONS INCIDENT TO BUSINESS USE.

Department stores require extensive loading facilities.

East 10th Street—Storage warehouse.

Carlton Avenue—Storage warehouse next to private houses.

South Portland Avenue—Storage warehouse and stables near private houses.

West 127th Street, looking east from Lenox Avenue—Stables and storage warehouses in residential section.

FIG. 90—STORAGE WAREHOUSE IN RESIDENCE STREET.

The storage warehouse rears its bulk high above surrounding buildings and is permitted to be built on the extreme lines of the lot, exempt from the laws that require residential buildings to provide yards and courts. In addition to cutting off their neighbor's light, many storage warehouses have the nuisance features of a large stable, and all are objectionable on a residence street on account of trucking and the danger and noise incident thereto.

63rd Street, between Fourth and Fifth Avenues, Brooklyn.

Washington Square North.

East 19th Street, near Third Avenue.

62nd Street, between Fourth and Fifth Avenues, Brooklyn.

FIG. 91—TYPES OF RESIDENCE STREETS.

Any of these streets may be ruined by a sporadic store or industry unless protected by a zone plan.

Lafayette Street, near Houston Street.

Broome Street, near Mercer Street.

Howard Street, near Broadway.

Mercer Street, near Grand Street.

FIG. 92—LOFTS TO LET.

The "uptown" movement of factories has had tragic economic consequences not only for the Fifth Avenue section but for the old loft district between Canal Street and Washington Square.

High School of Commerce, West 65th Street—Boys play on the street during the lunch hour.

Henry and Oliver Streets—Children "hang around" the street after school time.

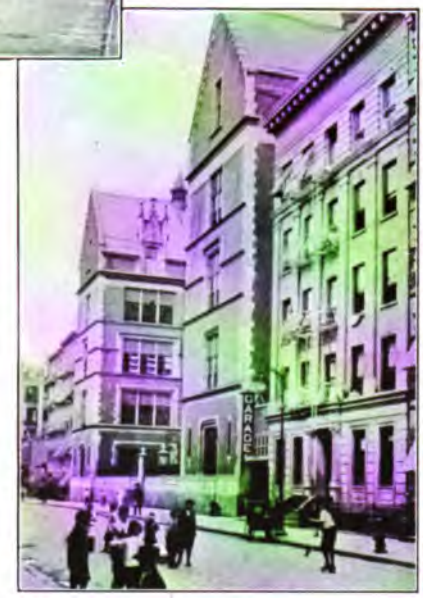
Lexington Avenue, corner 105th Street—Kindergarten children waiting on street until admitted to school.

Broome Street, near Clarke Street—Public school children in fire drill.

FIG. 93—THE ENVIRONMENT OF THE SCHOOL.

The environment of the school should be free from the street dangers and noise incident to industrial use.

West 59th Street, near Amsterdam Avenue—Gas tanks next to DeWitt Clinton High School.



West 101st Street, between Columbus and Amsterdam Avenues—Garage and auto repair shop next to public school.

East 104th Street, near Second Avenue—Wholesale hardware and woodenware house near public school.

West 58th Street, between Amsterdam and Eleventh Avenues—Gas tanks next to and factories opposite DeWitt Clinton High School.

FIG. 94—THE ENVIRONMENT OF THE SCHOOL.

Sheriff Street, near Broome Street—Machine shop, stable and storage next to public school.

Broome Street, near Clarke Street—5-story stable, 5-story loft building and 6-story machine shop near public school. Note children passing the stable.

Mangin Street, corner Stanton Street—Saw mill and loft building next to public school.

No. 33 East Broadway—Loft buildings next to public library.

FIG. 95—THE ENVIRONMENT OF THE SCHOOL.

1001 Bedford Avenue—Garage between a synagogue and a private house.

Washington Avenue, near Tremont Avenue—Garage between a private house and a church.

East 77th Street, between Lexington and Park Avenues—Garages and stables opposite German Hospital.

80th Street, corner West End Avenue—Garage next to church parish house.

FIG. 96—ENVIRONMENT OF CHURCH AND HOSPITAL.

Churches and hospitals have always been recognized as requiring a certain amount of isolation from the noise and bustle of business. There should be sections where they could locate free from the public garage or other undesirable neighbors.

North 11th Street, Williamsburg—Barrels of paint stored on the sidewalk for the entire length of block.

East 5th Street, near Lewis Street—Lumber yard and planing mill. Note lumber stored on sidewalk and roadway.

Java Street, Greenpoint—Lumber yard.

FIG. 97—PERILS OF THE SIDEWALK.

Whether the usurpation of the sidewalk has some justification in necessity or not, the fact that many kinds of industry are guilty should cause their exclusion from business and residence sections, in both of which the freedom of the sidewalk is essential to civic welfare. If the usurpation is unavoidable, the exclusion is imperative.

East 2nd Street, between Avenues C and D—Monument works in tenement district. Children and teachers attending the two public schools nearby are forced to take to the roadway.

East 2nd Street, between Avenues C and D.

412 East 85th Street—Stone cutter between private houses and tenements. The City was held liable to the extent of $1,400 for an injury caused to a child by the fall of one of these monuments.

FIG. 98—PERILS OF THE SIDEWALK.

Monument works hold a grim menace for the pedestrian and for children who play near the headstones.

West 24th Street, between Tenth and Eleventh Avenues—Horses being shod on the sidewalk.

339 East 107th Street, near First Avenue—Wet wash laundry next to tenement.

427 East 13th Street—Wet wash laundry.

FIG. 99—PERILS OF THE SIDEWALK.

In some cases industrial buildings are not satisfied with the sidewalk as a loading platform, but add an aerial danger to the pedestrian's perilous course by extending chutes or slides across his path so that trucks may be loaded from the second story windows

273 Greenpoint Avenue, Greenpoint—Chemical works.

Standard Oil Co., Greenpoint—Fleming works.

Oakland Street, corner of Paidge Avenue, Greenpoint—Box factory.

FIG. 100—TYPICAL INDUSTRIAL DISTRICTS.

Where factories are segregated they are free from the restraints and inconveniences to which they might be subjected in a residence section. They are not compelled to defend continual complaints in relation to noise, fumes and sidewalk obstruction. Their use of the street for heavy trucking is not inconvenienced by children playing in the street. Segregation is good for the factories and good for the tenements.

Newtown Creek.

East 14th Street, near the East River. (Courtesy of Frank B. Williams.)

Brooklyn Waterfront, opposite Houston Street, Manhattan.

Gowanus Canal.

FIG. 101—TYPICAL INDUSTRIAL DISTRICTS.

The above are typical of sections that are included in the proposed Zone plan as unrestricted districts.

Orchard Street, corner of Rivington Street.

Avenue C, looking north from East 5th Street.

East 5th Street, near Avenue C.

FIG. 102—PUSH CARTS AND STREET CONGESTION.

Stores on the ground floor have brought these push carts with a consequent congestion of sidewalk and street. Tenants are deprived of their legitimate use of the street and children are robbed of the only "playground" they might have. Drivers of fire apparatus dread these streets.

Bathgate Avenue, looking South.

Bathgate Avenue.

Bathgate Avenue, looking North from Claremont Parkway.

Bathgate Avenue.

FIG. 103—PUSH CARTS AND STREET CONGESTION.

This Bronx street was once lined with private residences, each with its lawn and shade trees. Had it been protected against the first small store it would never have come to this.

East 114th Street, near Fifth Avenue.

Rivington Street, near Sheriff Street.

Park Avenue, north of 102nd Street.

FIG. 104—PUSH CARTS AND STREET CONGESTION.

Fourth Avenue and 25th Street.

Fourth Avenue and 21st Street.

126 West 73rd Street.

FIG. 105—WINDOWS ON LOT LINE.

Adams Express Company Building—When the American Express Company's building is completed nearly all the windows in this side wall will be blocked up.

Adams Express Company Building—Windows being blocked up by the new American Express Company building.

FIG. 106—WINDOWS ON LOT LINE.

Vanderbilt Avenue, Brooklyn—Brass factory in rear of private homes.

West 165th Street—Beer bottling.

Prospect Avenue, between 181st and 182nd Streets—This factory is built up to its rear lot line. If a tenement it would have had to leave a yard space.

FIG. 107—FACTORY BUILDINGS CUTTING OFF LIGHT AND AIR FROM TENEMENTS.

East 6th Street, between Second and Third Avenues—Marble cutting, fur picking and sorting in rear of tenements.

Suffolk Street, near Houston Street—Granite cutting works occupy the whole of this tenement yard.

FIG. 108—REAR YARDS OF TENEMENTS USED FOR INDUSTRIES.

Tenement yards are a development of the garden space which was a valuable adjunct of the old private residence. Its importance as a playground free from the dangers of the street is emphasized by its very inadequacy for the hundreds who live in the tenement. Its usurpation then by business or industry is doubly reprehensible and the location of dangerous and noisy trades in these breathing spaces should be prohibited.

APPENDIX VI.—REPORT OF COMMITTEE OF THE WHOLE OF THE BOARD OF ESTIMATE AND APPORTIONMENT ON THE BUILDING ZONE PLAN

July 18, 1916.

To the Board of Estimate and Apportionment:

On June 2, 1916, the Commission on Building Districts and Restrictions, appointed pursuant to Sections 242a and 242b of the Charter, presented its final report recommending the boundaries of districts and appropriate regulations to be enforced therein for the purpose of regulating the height of buildings, the area of courts, yards and other open spaces, and the use of buildings and premises throughout the city.

The general support that has been given the proposed plan by every interest affected is proof both that it serves an urgent need and that it has been worked out with care, discrimination and moderation. The real estate, lending and building interests are united in their support of the plan; as are also the commercial and civic associations. Not a single organization of any kind has opposed the general plan. Two or three individuals have registered their unalterable opposition to the principle involved. If the plan had been presented only a few years ago the protestants would doubtless have been legion. A great change has come about in the way that people look at this question. Zoning instead of being regarded as confiscatory, unconstitutional, arbitrary and impractical, is now generally regarded as reasonable, obvious and absolutely necessary for the preservation of the city and of the property interests affected.

The Board of Estimate and Apportionment has control of the development of the physical plan of the city: the street and block layout, park and recreation system, sewerage system, transit and transportation system, and port and terminal facilities. As the Commission has pointed out: " No plan for the development of public facilities can be complete and effective unless there goes with it a comprehensive plan for the control of building development on private property." The Board also has under its financial control the activities of the various departments that have to do with sanitation, housing conditions, fire prevention, street traffic and the public health and safety generally. Your Committee is impressed with the necessity, for the more efficient functioning of these various public interests and activities, of adopting a comprehensive plan of city building such as has been presented by the Commission.

To consider the proposed plan in its relation to other plans for the physical development of the city, a subcommittee was appointed, consisting of Nelson P. Lewis, Chief Engineer of the Board, the consulting engineer of each of the five boroughs, the landscape architect of the Park Department and the consultant and secretary of the Committee on the City Plan of the Board. A copy of this subcommittee's report is appended. The report states that:

> " All of the members of the committee are convinced of the great need of restrictive regulations governing the height of buildings, the ues to which they may be put and the proportion of the plots which may be occupied by them. All of them have had ample opportunity to observe the manner in which the different boroughs and the city as a whole have lately been developing, and they keenly appreciate

the unfortunate results of the lack in the past of such regulations as as are proposed and the need of them to insure better control of future growth. They believe that the results of such control will be:

"To prevent undue congestion of population.

"To insure better sanitary conditions.

"To simplify the problem of traffic regulation.

"To lessen the danger and delay of movement in the city streets which is due to mixed traffic.

"To simplify the transit problems of the city.

"To prevent the over-intensive development of property contiguous to the new transit lines now being constructed.

"To render possible a more economical development of city streets through a decrease in the width of streets and roadways where the size and consequently the number of buildings are restricted.

"To insure the permanency of character of the districts when once established, and,

"Finally, to make the city a more orderly and convenient place in which to live and do business.

"The committee realizes the magnitude and difficulty of the task imposed upon the Commission and is impressed by the results which have been accomplished by it within the time which has elapsed since it was created, by the thoroughness of its investigation of existing conditions and by its obvious efforts to avoid anything which would seriously affect present values. It has not attempted to correct the mistakes of the past, but to avoid the repetition of similar mistakes in the future, so that its efforts have been wholly constructive."

A subcommittee was also appointed to consider the administration and technical features of the proposed plan as affecting building development. This subcommittee was composed of Rudolph P. Miller, Chairman of the Board of Standards and Appeals, the building superintendents of the five boroughs, the Tenement House Commissioner, the Fire Commissioner, John P. O'Brien, Assistant Corporation Counsel, and the Consultant and Secretary of the Committee on the City Plan. A copy of this report is appended. The subcommittee states:

"Your subcommittee is convinced that a well considered plan of building development is essential to the health, safety and prosperity of the city. Such a plan involves both the creation of residential, business and industrial districts and the regulation of the height of buildings and the area of courts and yards differently in different parts of the city. The plan presented by the Districting Commission seems admirably adapted to secure this result. We endorse generally the following principles which are fundamental in the Commission's proposed plan:

"1. Provision for light and air is a prime essential in building regulation.

"2. Building regulations in each section of the city should be adapted to the requirements of that section.

"3. It is desirable as a general rule to treat all buildings in a given block according to a uniform rule. There should be a substantially uniform contribution from each owner to the light and air of the block. Block ventilation is essential to well ordered develop-

ment. Rear yards should be required wherever buildings come back to back.

"4. A building is usually appropriately located when it is surrounded by buildings of similar type and use. Order in building development is essential to the health, safety and comfort of the public, and far from depressing values or working hardship to property owners generally, will actually conserve and enhance values.

"5. The residence sections should be protected against unnecessary invasion by commercial and industrial uses.

"6. The present congested condition in lower Manhattan constitutes a serious danger to life and property. Street congestion may interfere seriously with the movement of fire apparatus. The occupants of high office and loft buildings may be endangered by fire and panic.

"These and other considerations advanced in the Commission's report prove the urgent need for the adoption of a districting plan. The official duties of the members of this subcommittee bring to their notice the irreparable injury that, almost daily, is being brought about by the erection of inappropriate buildings or the establishment of business uses in residence sections. The remedy proposed is timely and appears to have been most carefully worked out."

The Districting Commission is composed of men eminently qualified for the important problem given them to solve. They have brought to the accomplishment of their task experience, expert knowledge and a willingness to give of their time and energy to a degree seldom equaled in an unpaid commission of this kind. The Commission's membership includes the very highest expert knowledge in real estate matters and building construction as well as in general civic interests, including public sanitation and safety. The plan that the Commission has presented is comprehensive and thorough-going, while at the same time it is moderate and practical. The Commission has adhered strictly to the only purposes for which the police power may be properly exercised, *i. e.*, the public health, safety, convenience, comfort and general welfare.

On June 19th, 21st, 27th and 29th the Board held hearings on the final report and plans of the Commission. At these hearings everyone who appeared and desired to be heard was heard. The hearing was continued until July 25th, so that at that time an opportunity might be given to any one objecting to any changes in the final report of the Commission which might be recommended in the report of this Committee.

Your Committee has carefully considered the final report of the Commission and every protest and criticism in regard thereto which has been presented to the Board. The moderation exercised by the Commission in its plans is evidenced by the fact that a large proportion of the criticisms made by property owners directly interested were that more restrictive regulations should be applied than those proposed. A list of the more important changes in district boundaries approved by your Committee is attached to this report (see Exhibit I). New maps showing the districts approved by your Committee have been prepared and have been opened to public inspection in the office of the Committee on the City Plan.

The Districting Resolution submitted with the final report of the Commission has also been carefully considered. Here there were numerous criticisms of details particularly with reference to its relation to the provisions of the Tenement House Law. Your Committee submits a Dis-

tricting Resolution for consideration which, while it does not differ in principle from that submitted by the Commission, contains numerous changes in detail and in form of expression.

JOHN PURROY MITCHEL, Mayor.
FRANK L. DOWLING, President, Board of Aldermen.
WM. A. PRENDERGAST, Comptroller.
RALPH FOLKS, Acting President, Borough of Manhattan.
LEWIS H. POUNDS, President, Borough of Brooklyn.
DOUGLAS MATHEWSON, President, Borough of The Bronx.
MAURICE E. CONNOLLY, President, Borough of Queens.

EXHIBIT I—PRINCIPAL CHANGES MADE IN USE, HEIGHT AND AREA DISTRICT MAPS SUBMITTED BY DISTRICTING COMMISSION

1. Use District Map

(a) Borough of Manhattan

1. Indian Road from 100 feet west of Isham Street to Isham Park. Changed from residence to business.

2. 158th Street from 430 feet west of Riverside Drive to the railroad. Changed from residence to business.

3. 146th Street between Broadway and Amsterdam Avenue. Changed from business to residence.

4. 131st Street between Lenox Avenue and Seventh Avenue, and Fifth Avenue between 131st Street and 126th Street. Changed from business to residence.

5. 57th Street between Madison Avenue and Lexington Avenue. Changed from residence to business.

6. 57th, 56th and 55th Streets between Eighth Avenue and Ninth Avenue. Changed from business to residence.

7. Sixth Avenue from 29th Street to within 100 feet of 31st Street. Changed from business to unrestricted.

8. 23d Street between Ninth Avenue and Tenth Avenue. Changed from business to residence.

9. 16th Street between Sixth Avenue and Seventh Avenue. Changed from unrestricted to business.

10. West 8th Street from Fifth Avenue to within 100 feet east of Macdougal Street and the west side of University Place between Waverley Place and Eighth Street. Changed from business to residence.

11. 13th Street between Eighth Avenue and Hudson Street; Gansevoort Street between Hudson Street and 13th Street; Fourth Street between Gansevoort Street and Horatio Street, and Eighth Avenue between Greenwich Street and Horatio Street. Changed from business to unrestricted.

12. Madison Avenue, west side, from 35th Street to 37th Street, and from 38th Street to 39th Street. Changed from business to residence.

13. West 3d Street and Macdougal Street. Intersection and four corners changed from business to unrestricted.

14. Patchin Place and Milligan Place. Changed from residence to business.

15. 84th Street from Lexington Avenue to Third Avenue. Changed from residence to business.

(b) Borough of The Bronx

1. Van Cortlandt Park South from Broadway to Bailey Avenue. Changed from business to residence.

2. Mosholu Parkway North between Jerome Avenue and Gun Hill Road. Changed from business to residence.

3. Bailey Avenue between 230th Street and 233rd Street except at the intersection of 231st Street; Bailey Avenue between 238th Street and Van Cortlandt Park South; Putnam Avenue East between 238th Street and Van Cortlandt Park South; Putnam Avenue West between 238th Street and Van Cortlandt Park South, 239th Street between Broadway and Putnam Avenue West; and Review Place between West 238th Street and Van Cortlandt Park South. Changed from business to residence.

4. 233d Street between Webster Avenue and Bronx Boulevard. Changed from residence to business.

5. Bedford Park Boulevard from the Concourse to Decatur Avenue. Changed from business to residence.

6. 184th Street between Aqueduct Avenue and Jerome Avenue. Changed from business to residence.

7. 181st Street from Boston Road to within 100 feet of Bryant Avenue. Changed from residence to business.

8. 183d Street between Grand Concourse and Webster Avenue. Changed from business to residence.

9. 177th Street and 176th Street between Jerome Avenue and the Concourse. Changed from business to residence.

10. Morris Avenue between 174th Street and Belmont Street. Changed from business to residence.

11. 172d Street from Jesup Avenue to within 100 feet of Plimpton Avenue. Changed from business to residence.

12. Cromwell Avenue from 169th Street to Macomb's Road. Changed from business to unrestricted.

13. Shore Drive between Layton Avenue and Lafayette Avenue. Changed from business to residence.

14. Whittemore Avenue between Fort Schuyler Road and Balcom Avenue. Changed from residence to business.

15. 153d Street between Mott Avenue and Gerard Avenue, and Walton Avenue between 153d Street and the railroad. Changed from business and unrestricted to residence.

16. 142d Street and 143d Street between Willis Avenue and Brook Avenue. Changed from business to residence.

17. 145th Street and 146th Street from Brook Avenue to St. Anns Avenue. Changed from business to residence.

18. Mott Avenue from 153d Street to 156th Street; 156th Street from Sheridan Avenue to Mott Avenue. Changed from residence to unrestricted.

19. Mott Avenue and Walton Avenue between 144th Street on the south and the railroad on the north; 146th Street, 150th Street and 151st Street between Walton Avenue and Mott Avenue; 149th Street between Gerard Avenue and Mott Avenue, and Cedar Lane, between 150th Street and the railroad. Changed from unrestricted to business.

20. West 242d Street from Spuyten Duyvil Road to a point 450 feet east. Changed from business to residence.

21. Pelham Parkway South, from Wilson Avenue to Neill Avenue. Wilson Avenue, from Pelham Parkway South to Neill Avenue. Neill Avenue, from Wilson Avenue to Pelham Parkway South. Changed from business to residence.

22. East 205th Street, from Webster Avenue to the New York Central R. R. Changed from residence to business.

23. Esplanade, along both sides of the New York, Westchester and Boston Railway, from Laconia Avenue to Astor Avenue. Changed from residence to business.

(c) Borough of Brooklyn

1. Hicks Street, from 100 feet south of Cranberry Street to within 100 feet of Poplar Street. Changed from residence to business.

2. Clark Street, from 100 feet east of Henry Street to within 100 feet of Fulton Street. Changed from business to residence.

3. Grace Court Alley. Changed from residence to business.

4. Evergreen Avenue, between Himrod Street and Cedar Street. Changed from unrestricted to business.

5. East 21st Street, from Lincoln Road to Parkside Avenue; Parkside Avenue from Ocean Avenue to Flatbush Avenue; Ocean Avenue, from Parkside Avenue to Woodruff Avenue, and Woodruff Avenue, from Ocean Avenue to Flatbush Avenue. Changed from business to residence.

6. Albany Avenue, from Eastern Parkway to Union Street. Changed from residence to business.

7. Jamaica Avenue, from east side of Schenck Avenue to west side of Dresden Street. Changed from business to residence.

8. Arlington Avenue, from Linwood Street to Shepherd Street. Changed from residence to business.

9. 66th Street, from Fifth Avenue to Ninth Avenue. Changed from unrestricted to business.

10. 13th Avenue, from 79th Street to 86th Street. Changed from residence to business.

11. 17th Avenue, from 53d Street to 55th Street. Changed from business to residence.

12. Avenue M, between East 91st Street and East 93d Street and Avenue N, between East 92d Street and East 93d Street. Changed from residence to business.

13. Emmons Avenue, easterly end, and streets between Emmons Avenue and waterfront. Changed from residence to business.

14. 47th Street, between 18th Avenue and Washington Avenue; Lawrence Avenue, between 47th Street and Gravesend Avenue. Changed from business to residence.

15. Coney Island Avenue, from Johnson Street to Park Circle. Changed from unrestricted to business.

16. Caton Place, from Coney Island Avenue to East 8th Street and East 8th Street, from Caton Place to Henry Street. Changed from business to unrestricted.

17. Nostrand Avenue, from Atlantic Avenue to Fulton Street. Changed from residence to business.

(d) Borough of Queens

1. Eighth Street, between Jackson Avenue and East Avenue. Changed from business to unrestricted.

2. Laurel Hill section. Columbine and Cassel Avenues. Changed from residence and business to unrestricted, including intervening cross streets.

3. Babbage Street, between St. Ann's Avenue and Richmond Street, on the north side of the railroad and Bessemer Street on the south side of the railroad. Changed from business to residence.

4. Ray Street, one block north of Jamaica Avenue, and Essex Place (Charles Street), one block to the east of Ray Street. Changed from residence to business.

5. Beach 129th Street, in the block north of Newport Avenue. Changed from unrestricted to business.

6. Beach 117th Street, from Channel Drive to Ocean Promenade. Changed from business to residence.

7. Beach 116th Street, from Channel Drive to Rockaway Beach Boulevard. Changed west side from unrestricted to business.

8. Area between bulkhead line and Channel Drive and between Beach 117th Street and Beach 124th Street. Changed from residence to business.

9. East of Calvary Cemetery—Congress Avenue and Townsend Avenue, from Hobson Avenue to Montgomery Avenue; Waters Avenue and Joy Avenue, from Laurel Hill Boulevard to Hobson Avenue. Changed from residence to business.

(e) Borough of Richmond

1. North side of Richmond Terrace and Jay Street, from Westervelt Avenue to South Street. Changed from unrestricted to business.

2. Central Avenue, from Hyatt Street to Richmond Turnpike (Wiener Place). Changed from business to residence.

3. St. Marks Place and Carroll Place, from Westervelt Avenue to Nicholas Street; Tompkins Avenue and St. Marks Place, from Nicholas Street to Hyatt Street; Nicholas Street, from Carroll Place to St. Marks Place; Wall Street and Hamilton Avenue, from Carroll Place to Tompkins Avenue; Carroll Place, from Hamilton Avenue to Wall Street; Fort Place, from Tompkins Avenue to Montgomery Avenue, and Montgomery Avenue, from Fort Place to trolley right of way at head of Hyatt Street. Changed from business to residence.

4. Richmond Avenue, from Castleton Avenue to Richmond Terrace (Ann Street); Richmond Terrace (Ann Street), from Richmond Avenue to Jewett Avenue, and Jewett Avenue, from Cary Avenue to Richmond Terrace. Changed from unrestricted to business.

5. Bennett Street, Vreeland Street, Edison Street (Elizabeth Street), Cedar Street (New Street), Bond Street, Rawson Street (Broadway), Heberton Avenue, Cottage Place, Brunswick Street (Avenue B), Stafford Street (Simonson Place), bounded by Richmond Avenue, Richmond Terrace (Ann Street), Jewett Avenue and Castleton Avenue. Changed from unrestricted to residence.

6. Anderson Avenue, Albion Place, Rawson Street (Broadway), Heberton Avenue, Degroot Place (Washington Place) and Stafford Street (Simonson Place), north of Catherine Street, bounded by Richmond Avenue, Castleton Avenue, Jewett Avenue and Cary Avenue. Changed from business to residence.

7. College Avenue, Manor Road to Jewett Avenue. Changed from business to residence.

8. Richmond Terrace, south side, 100 feet east of Clove Road to Taylor Street. Changed from unrestricted to business.

9. Bodine Street and Dongan Street; Castleton Avenue to Richmond Terrace; Cedar Street, Clove Road to Taylor Street; Taylor Street; Castleton Avenue to Trinity Place; Henderson Avenue; Taylor Street to Drake

Place; Dongan Street and Taylor Street, from Cary Avenue to Castleton Avenue, and White Place. Changed from business to residence.

10. Taylor Street, from Trinity Place to Richmond Terrace, and Trinity Place, from Taylor Street to Barker Street. Changed from unrestricted to residence.

11. First Street, from Clinton Avenue to Franklin Avenue; Clinton Avenue and Lafayette Avenue, from First Street to Richmond Terrace, and Franklin Avenue, from Second Street to Richmond Terrace. Changed from unrestricted to business.

12. Second Street, from Clinton Avenue to Franklin Avenue; Clinton Avenue from Second Street to Third Street; Lafayette Avenue, from First Street to Third Street, and Franklin Avenue, from Second Street to Third Street. Changed from unrestricted to residence.

13. Clinton Avenue, from First Street to Second Street. Changed from unrestricted to business.

14. Rosebank Avenue (Center Street), east side, from Young Street to Vanderbilt Avenue. Changed from unrestricted to business.

15. Rosebank Avenue (Center Street), west side, Vanderbilt Avenue to Marathon Avenue (Simonson Avenue). Changed from business to residence.

16. Rosebank Avenue (Center Street), east side Vanderbilt Avenue to Marathon Avenue (Simonson Avenue), Talbot Street and Albemarle Street (Cross Street), Farragut Avenue to Marathon Avenue (Simonson Avenue), Vanderbilt Avenue, Norwood Avenue and Townsend Avenue, Rosebank Avenue (Center Street) to Albemarle Street (Cross Street). Changed from unrestricted to residence.

17. Indiana Avenue, from Jewett Avenue to Wooley Avenue. Changed from business to residence.

18. Area bounded by Van Pelt Avenue, Orange Street, Morningstar Road and Washington Avenue. Changed from residence to unrestricted.

19. Jewett Avenue, from Purvis Place (Maple Avenue) to Washington Place. Changed from business to residence.

2. Height District Map

(a) Borough of Manhattan

1. Madison Avenue, between 34th Street and 40th Street. Changed from two times height district to 1½ times height district.

(b) Borough of Brooklyn

1. Area on Brooklyn Heights, bounded by Furman Street, Middagh Street, Hicks Street, Clark Street, Fulton Street, Clinton Street and Joralemon Street. Changed from 1½ times height district to two times height district.

2. Area on Brooklyn waterfront between Atlantic Avenue and Degraw Street, and between the bulkhead line and Columbia, Harrison and Van Brunt Streets. Changed from two times height district to 2½ times height district.

(c) Borough of Queens

1. Elmhurst section bounded by 18th Street, Broadway, Corona Avenue, Parcell Street, Junction Avenue and Burnside Avenue. Changed from 1¼ times height district to 1½ times height district.

2. Elmhurst section bounded by Broadway, Corona Avenue, Parcell Street, Junction Avenue and Norton Street. Changed from 1¼ times height district to one times height district.

3. Area District Map

(a) Borough of The Bronx

1. New D District, Bedford Park, bounded as follows: Beginning at the intersection of the east side of the Grand Boulevard and Concourse with the west side of Mosholu Parkway South; thence south along the south side of Mosholu Parkway South; south along the west side of Decatur Avenue; east along the south side of E. 201st Street; south parallel to and 100 feet east of the east side of Decatur Avenue; west parallel to and 100 feet north of the north side of Bedford Park Boulevard; south along the west side of Decatur Avenue; west parallel to and 100 feet south of the south side of Bedford Park Boulevard; south parallel to and 100 feet east of the east side of Marion Avenue; west parallel to and 100 feet north of the north side of E. 198th Street; south along the west side of Marion Avenue; west along the north side of E. 198th Street; north along the east side of Bainbridge Avenue; west parallel to and 100 feet south of the south side of Bedford Park Boulevard; north along the east side of the Grand Boulevard and Concourse to the point of beginning.

2. New D District, University Heights, bounded as follows: Beginning at the intersection of the south side of 183d Street with the west side of the Old Croton Aqueduct; south along the west side of the aqueduct; west along the north side of W. 180th Street and W. 180th Street prolonged; north along the easterly property line of the New York Central Railroad to a point just north of the intersection of Cedar Avenue and Harlem River Terrace; north parallel to and 100 feet west of the west side of Cedar Avenue to the prolongation of the south side of W. 182d Street; east along said prolongation and the south side of W. 182d Street; north along the east side of Sedgwick Avenue; east along the south side of E. 183d Street to the point of beginning.

3. New D District, Riverdale, bounded as follows: Beginning on the west side of Riverdale Avenue 900 feet south of the south side of W. 246th Street; west 110 feet; south parallel to and 110 feet west of the west side of Riverdale Avenue and Spuyten Duyvil Parkway; west parallel to and 100 feet north of the north side of W. 239th Street and its prolongation towards Riverdale Avenue; south parallel to and 200 feet west of the west side of Independence Avenue; east parallel to and 100 feet south of the south side of W. 237th Street; north along the west side of Spuyten Duyvil Parkway to the south side of W. 237th Street east across Spuyten Duyvil Parkway in line with the south side of W. 237th Street; north parallel to and 100 feet east of Spuyten Duyvil Parkway to and across Johnson Avenue; east along the north side of W. 238th Street to and across Riverdale Avenue; north parallel to and 100 feet east of Riverdale Avenue to a point approximately opposite the place of beginning.

4. Changes in E District, Riverdale: The foregoing D District has been taken out of the Riverdale E District and the boundaries of the E District have been slightly altered so as to conform to the petition of the Park District Protective League and other owners. The revised boundary line is as follows: Beginning at the shore line of the Hudson River 750 feet north of the north bulkhead line of Harlem River; east perpendicular to the shore line of the Hudson River; east along the north side of Spuyten Duyvil

Road; east and south along the north side of Johnson Avenue; north along the west side of Kappock Street; east parallel to and 100 feet south of the south side of Netherland Avenue; east parallel to and 100 feet south of the south side of W. 227th Street; north parallel to and 100 feet east of the east side of Edgehill Avenue; north along the west side of Johnson Avenue; west along the south side of W. 232d Street; north along the west side of Fairfield Avenue; north parallel to and 100 feet east of the east side of Spuyten Duyvil Parkway; north along the east side of Netherland Avenue; west across Spuyten Duyvil Parkway along the line of the south side of W. 237th Street; south along the west side of Spuyten Duyvil Parkway; west parallel to and 100 feet south of the south side of W. 237th Street; north parallel to and 200 feet west of the west side of Independence Avenue; east parallel to and 100 feet north of the north side of W. 239th Street and the north side prolonged towards Spuyten Duyvil Parkway; north parallel to and 110 feet west of Spuyten Duyvil Parkway and Riverdale Avenue; east to a point 900 feet south of the south side of W. 246th Street and the west side of Riverdale Avenue; east across Spuyten Duyvil Parkway; east and south parallel to Spuyten Duyvil Parkway and 100 feet south and west of the south and west sides; east across Fieldston Road and along the north side of W. 242d Street; east along the line of the public park out into Waldo Avenue; north along the center line of Tibbett Avenue prolonged; east along the north side of W. 244th Street; north along the west side of Cayuga Avenue; west along the south side of W. 246th Street; north along the west side of Tibbett Avenue; north along a line drawn between the center of the north end of Tibbett Avenue and the center of the south end of Valles Avenue to the south side of W. 253d Street; west along the south side of W. 253d Street; north parallel to and 100 feet east of Iselin Avenue; west along the prolongation of the south side of W. 256th Street and along the south side of the same street; north along the west side of Mosholu Parkway; west along a line parallel to and 500 feet north of W. 256th Street; north along the west side of Netherland Avenue; west along the south side of W. 261st Street and its prolongation to the shore line of the Hudson River; south along the shore line of the Hudson River to the point of beginning.

5. New D District, Edenwald, bounded as follows: Beginning at the city line 100 feet south of Nereid Avenue; west parallel to and 100 feet south of Nereid Avenue; south through the middle of the block between Ely Avenue and Bruner Avenue; west parallel to and 100 feet south of Pitman Avenue; south through the middle of the block between Wickham Avenue and Gunther Avenue; south parallel to and 100 feet east of Paulding Avenue; east through the middle of the block between E. 226th and 227th Streets; east parallel to and 100 feet north of Schieffelin Avenue; north through the middle of the block between Edson Avenue and Baychester Avenue; east parallel to and 100 feet north of E. 233d Street; north parallel to and 100 feet west of Pratt Avenue; north along the city line to the point of beginning.

6. New E District, around the Country Club, bounded as follows: Beginning at the east end of the southern boundary of Pelham Bay Park at the shore of Eastchester Bay; west along the southern boundary of Pelham Bay Park; south parallel to and 100 feet east of Eastern Boulevard; east parallel to and 100 feet south of South Road; south parallel to and 100 feet west of East Road; east along the north side of Fairmount Avenue and the same prolonged to Eastchester Bay; north along the shore of Eastchester Bay to the point of beginning.

(b) Borough of Brooklyn

1. Bay Ridge E District. The northern boundary has been moved two blocks south so as to lie in the center of the block between 75th Street and 76th Street, extending from the bulkhead line west of the Shore Road to the existing line 100 feet east of Ridge Boulevard; whence it continues as at present east to a point 100 feet west of Third Avenue; south parallel to and 100 feet west of Third Avenue; west in the middle of the block between 77th and 78th Streets; south parallel to and 100 feet east of Ridge Boulevard; east in the center of the block between 79th and 80th Streets; south parallel to and 100 feet west of Third Avenue, and so on as before.

2. Dyker Heights E District. The easterly boundary of this district has been moved from 100 feet east of 13th Avenue to 100 feet west of 13th Avenue, leaving both sides of this avenue wholly in D.

3. New E District, Ditmas Park West, bounded as follows: Beginning on the south side of Dorchester Road at the western boundary of the Ditmas Park E District; west along the south side of Dorchester Road; south along the east side of Stratford Road; east parallel to and 100 feet south of the south side of Ditmas Avenue; south parallel to and 100 feet west of the west side of Westminster Road; east parallel to and 120 feet north of the north side of Newkirk Avenue to the east property line of the Brighton Beach line, from which point the southerly boundary of the Ditmas Park E District has been moved north to a line 120 feet north of and parallel to the north side of Newkirk Avenue to the east side of E. 17th Street.

4. New D District, Highland Park South, bounded as follows: Beginning at the intersection of the south side of Jamaica Avenue and the west side of Dresden Street; south along the west side of Dresden Street; east along the south side of Etna Street; south along the west side of Force Tube Avenue; south along the west side of Hale Avenue; east along the south side of Ridgewood Avenue; south parallel to and 100 feet east of the east side of Hale Avenue; west parallel to and 100 feet north of the north side of Arlington Avenue; south along the west side of Elton Street; west parallel to and 100 feet north of the north side of Fulton Street; north parallel to and 100 feet west of the west side of Miller Avenue and Miller Place; west parallel to and 100 feet south of the south side of Sunnyside Avenue; north parallel to and 100 feet east of the east side of Vermont Avenue; west along the north side of Sunnyside Avenue; north along the east side of Vermont Avenue; south and east along the Borough line; south along the west side of the National Cemetery; west along the north side of Jamaica Avenue to the line of the west side of Dresden Street and the point of beginning.

5. New A District, Coney Island, bounded as follows: Beginning at the bulkhead line of the Atlantic Ocean on the east side of W. 37th Street, north along the east side of W. 37th Street; east along the south side of Surf Avenue to the west side of W. 5th Street; south along the west side of W. 5th Street to the Atlantic Ocean, and west to the point of beginning. Both sides of Surf Avenue are now A between the east side of Stillwell Avenue and the west side of W. 5th Street.

(c) Borough of Queens

1. Flushing E District. The northern boundary of this district has been shifted from north of Jackson Avenue to a new line to the south, making a C District along both sides of Jackson Avenue from Whitestone Avenue and Bowne Avenue to Ziegler Avenue (Central Avenue). State

Street is now in D from a point 100 feet east of the east side of Whitestone Avenue to a point 100 feet west of the west side of Ziegler Avenue (Central Avenue), the boundary line between C and D being located 150 feet south of and parallel to State Street. The northern boundary of the E District now begins at a point 100 feet west of Bowne Avenue and 150 feet south of Jackson Avenue, running east parallel to Jackson Avenue and 150 feet south to the west side of Parsons Avenue; crossing Parsons Avenue, the line is parallel to and 100 feet south of the south side of Jackson Avenue until it meets a line extending north from and perpendicular to the north side of Burcker Street (Washington Street), distant 415 feet from the west side of Percy Street; east on the north side of Burcker Street (Washington Street); crossing Percy Street, the line is parallel to and 150 feet south of Jackson Avenue to the existing E boundary line 100 feet west of the west side of Central Avenue.

2. Powell's Cove Section. This has been changed from D to A by extending the A District at College Point as follows: Beginning on the south side of Fletcher Avenue at the west side of Scranton Street; east along the south side of Fletcher Avenue; north along the east side of Vinton Street; west along the north side of Draper Avenue; north along the east side of Torrington Street; west along the north side of Brackenridge Avenue; north along the east side of Scranton Street; west along the north side of Audubon Avenue; north along the east side of Rockville Street to the East River; east along the bulkhead line of the East River; south along the west side of Chesterfield Boulevard; west along the north side of Yancey Street; south along the west side of Yancey Street; west along the north side of Tolland Street to the existing A District line on the west side of Torrington Street.

3. New C District, Rockaway, bounded as follows: On the west by the easterly boundary of the E District, which has been moved one block east, so as to be in the center of the block between Beach 116th Street and Beach 117th Street, instead of between Beach 117th Street and Beach 118th Street; on the east the line is in Beach 75th Street, making the boundary line 100 feet east of and parallel to Beach 75th Street; on the south by the shore line of the Atlantic Ocean; on the north by the existing boundary of the A District, viz., east along the north side of Beach Drive from the center of the block between Beach 116th Street and Beach 117th Street; south along the east side of Beach 116th Street; east along the north side of St. Mark's Avenue; south along the east side of Beach 103d Street; east along the north side of Rockaway Beach Boulevard; north along the west side of Beach 87th Street; east along the south property line of the Long Island Railroad; south along the east side of Beach Street; east along the north side of Finnard Street; north along the west side of Beach 80th Street; south along the south property line of the Long Island Railroad to the easterly boundary in Beach 75th Street.

4. Woodhaven. Owing to the discontinuance on the City map of Ridgewood Avenue, between Herald Avenue and Cedar Avenue, the southern boundary of the C district near Jamaica Avenue now leaves Ridgewood Avenue at Oxford Avenue and is located in the center of the following streets: Oxford Avenue, Fulton Street, Herald Avenue, Fulton Street, Bedford Avenue, Fulton Street, Stoothoff Avenue to Ridgewood Avenue.

(d) Borough of Richmond

1. Clifton. The boundary of the A district has been changed from Townsend Avenue and Rosebank Avenue and is now located on the east

side of Bay Street, from Townsend Avenue to Marathon Avenue, and on the south side of Marathon Avenue, from Bay Street to Rosebank Avenue. The western boundary of the B district is continued south in the center of Rosebank Avenue, from Townsend Avenue, joining the A boundary at Marathon Avenue.

4. General Changes

In order to define more clearly the boundaries of particular districts a number of detailed changes have been made. On the use district map many such changes have been made in the designation shown at street intersections. A number of short blocks with a residence district designation in the street between two business districts have been changed to business districts. This was to conform to a change in the resolution. The resolution submitted by the Districting Commission gave the Building Superintendent discretion to change a residence district that had a street frontage of not more than 100 feet and was bounded on either side by business or unrestricted districts. This discretionary power is omitted in the resolution submitted by the Committee, but on the map submitted short residence blocks that would be pocketed in this way have been changed to business districts.

SUPPLEMENTAL CHANGES

MAP CHANGES APPROVED BY COMMITTEE OF THE WHOLE JULY 25, 1916, SUPPLEMENTING AND AMENDING CHANGES INCLUDED IN REPORT OF SAID COMMITTEE DATED JULY 18, 1916.

Use District Map

(a) BOROUGH OF MANHATTAN

1. West 57th Street, from Ninth Avenue to Tenth Avenue. Changed from business to residence.
2. West 57th Street, from Eighth Avenue to Ninth Avenue. Changed from residence to business.

(b) BOROUGH OF THE BRONX

1. West 172d Street, from Macomb's Road to Jerome Avenue. Changed from unrestricted to business.

(c) BOROUGH OF BROOKLYN

1. East 21st Street, from Lincoln Road to Parkside Avenue; Chester Court and Parkside Avenue, from East 21st Street to Flatbush Avenue. Changed from residence to business.
2. East 85th Street, East 86th Street, East 87th Street, East 88th Street and East 89th Street, from Avenue B to Ditmas Avenue, and East 84th Street, from Ralph Avenue to Ditmas Avenue. Changed from residence to unrestricted.
3. Avenue B, from Remsen Avenue to Ralph Avenue. Changed from residence to business.

Area District Map

(a) BOROUGH OF QUEENS

1. Changes in C district east of Flushing Creek and south of State Street. This district has been extended to the south. The new boundary line extends from the existing line in Rosedale Avenue, south in Rosedale

Avenue to 45th Avenue, west in 45th Avenue and Franconia Avenue to Parsons Avenue, north of Parsons Avenue to California Avenue, and west in California Avenue to Crommelin Avenue. The entire Flushing E district has been changed to a C district.

2. Change in D district between Newtown and Flushing Creek. The portion of this district west of Junction Avenue has been changed from D to C.

3. Flushing River A district. This district has been extended to the west between Jackson Avenue and Gunther Street, from the east side of Gilroy Street, to the east side of Peartree Avenue, between Gunther Street and Pell Street and to the east side of Pell Street between Peartree Avenue and Jackson Avenue.

EXHIBIT II—REPORT OF SUBCOMMITTEE ON RELATION OF PROPOSED PLAN TO OTHER PLANS OF CITY DEVELOPMENT

June 15, 1916.

To the Committee on the City Plan:

Gentlemen—The Mayor, as the Chairman of the Committee on City Plan, has appointed a special committee consisting of the Chief Engineer of the Board of Estimate and Apportionment, the five Borough Consulting Engineers, the Landscape Architect of the Park Department, and the Consultant and Secretary of the Committee on the City Plan to consider the recommendations and plans of the Districting Commission and report to the Committee on the City Plan.

This committee has given such consideration to the recommendations and plans of the Districting Commission as the time at its disposal permitted. While the report and plans had been in the hands of the members of the committee for too short a time to enable them to make a thorough study of them, all of the members of the committee were quite familiar with the work of the Commission and most of them attended the public hearings which have been given, particularly those at which consideration was given to the boroughs represented by them. All of the members of the committee are convinced of the great need of restrictive regulations governing the height of buildings, the use to which they may be put and the proportion of the plots which may be occupied by them. All of them have had ample opportunity to observe the manner in which the different boroughs and the City as a whole have lately been developing and they keenly appreciate the unfortunate results of the lack in the past of such regulations as are proposed and the need of them to insure better control of future growth. They believe that the results of such control will be:

To prevent undue congestion of population.
To insure better sanitary conditions.
To simplify the problem of traffic regulation.
To lessen the danger and delay of movement in the City streets which is due to mixed traffic.
To simplify the transit problems of the City.
To prevent the over-intensive development of property contiguous to the new transit lines now being constructed.
To render possible a more economical development of City streets through a decrease in the width of streets and roadways where the size and consequently the number of buildings are restricted.

To insure the permanency of the character of districts when once established, and,

Finally, to make the City a more orderly and convenient place in which to live and do business.

The Committee realizes the magnitude and difficulty of the task imposed upon the Commission and is impressed by the results which have been accomplished by it within the time which has elapsed since it was created, by the thoroughness of its investigation of existing conditions and by its obvious efforts to avoid anything which would seriously affect present values. It has not attempted to correct the mistakes of the past, but to avoid the repetition of similar mistakes in the future, so that its efforts have been wholly constructive.

In some cases it has seemed to us that the restrictions could well have gone further, but in few, if any, cases does it appear to us that they have gone too far. The following instances are typical of those we have in mind:

Along the easterly side of the unused part of Jerome Park Reservoir, in the Borough of The Bronx, Jerome Avenue is unrestricted between Bedford Park Boulevard and Van Cortlandt Avenue, and restricted to business north of Van Cortlandt Avenue to its junction with Bainbridge Avenue, while Mosholu Parkway South, forming the northeasterly boundary of the reservoir, is restricted to residences. This seems to be an entirely reasonable plan, but we understand that it is proposed to establish a railroad terminal yard in connction with the Jerome Avenue elevated line on the northerly portion of this unused easterly basin of the reservoir, so that the restriction against anything but residences along Mosholu Parkway South could well be limited to a depth of 100 feet in order that such a railroad terminal might be established on this unused property.

The Park Department has urged greater restrictions about Hudson Park, in the Borough of Manhattan. The report of the Commission contemplates a restriction to residences on the northerly and southerly boundaries of the park, but leaves the easterly and westerly boundaries, which are Hudson Street and the new Seventh Avenue extension, unrestricted. We understand that the character of the two streets last named has been so firmly established that a restriction to business only would be of little avail, in view of the fact that it is not planned to interfere with the uses which now exist.

Along the northerly side of Bay Ridge Parkway, in the Borough of Brooklyn, the four blocks between 5th and 9th Avenues are entirely unrestricted, the reason for this, as explained by the Consultant and Secretary of the Committee on the City Plan, being that a gas receiver is already located on the most easterly of these blocks and the three others are so near the New York Connecting Railroad that they would be within the influence of the industrial development which will take place along the line of this road. The majority of the committee feel that the streets bounding this parkway, which is the main approach to the Shore Road, should be reserved for residential use, a use which has always been contemplated in the establishment of parks and parkways. Another instance in this same borough where it appears that the restrictions might have gone further is that of Parkside Avenue, between Flatbush and Ocean Avenues, and East 21st Street, extending from Parkside Avenue northwardly. These are both indicated as business streets, and, while they are near a station of the Brighton Beach Railroad, which might be expected to attract a small amount of business, they are so near Flatbush Avenue, the main business street of this section, that they could well be restricted to residences, as this neighborhood promises to be almost entirely built up with apartment houses.

In the Borough of Queens eight short blocks at the westerly end of Queens Boulevard were shown as entirely unrestricted, the remainder of this great avenue being designated as a business street. It is true that there is one building at the extreme westerly end of this street now devoted to high class industrial use—that is, the assembling of parts of motor cars, and we understand that it is proposed to erect another building devoted to this same purpose on the next block to the east, and inasmuch as there are no railroad or shipping facilities within several blocks of any part of this street, such industrial development as may take place will be of an unobjectionable character, and yet the City has established the exceptional width of 200 feet for this boulevard and the elevated rapid transit line erected within its lines is of an ornamental character, designed to be in keeping with a street of this kind and it may be that the restriction of this part of the street to business only would be desirable.

A further study of the plans would doubtless disclose other cases where the restrictions might have gone further, but we believe that the important thing is that the plan proposed by the Commission be put in force at the earliest possible date, and, unless some slight changes, such as those which have been noted, can be made, if upon further consideration they seem to be wise, without delaying the adoption of the Commission's report and putting its recommendations into effect, we are not disposed to advise any modification of the present plans particularly in view of the provisions in the proposed ordinances which will render it possible to make such changes affecting certain streets or districts as may at some future time appear to be desirable.

Respectfully submitted on behalf of the committee.

(Sgd.) NELSON P. LEWIS, Chief Engineer of the Board of Estimate and Apportionment.

EXHIBIT III—REPORT OF SUBCOMMITTEE TO CONSIDER DISTRICTING RESOLUTION

June 16, 1916.

Committee on the City Plan, Board of Estimate and Apportionment:

Gentlemen—Your subcommittee, appointed to consider the Districting Resolution submitted to the Board by the Commission on Building Districts and Restrictions in its final report of June 2d, begs to submit the following report:

Your subcommittee is convinced that a well considered plan of building development is essential to the health, safety and prosperity of the City. Such a plan involves both the creation of residential, business and industrial districts and the regulation of the height of buildings and the area of courts and yards differently in different parts of the City. The plan presented by the Districting Commission seems admirably adapted to secure this result. We endorse generally the following principles, which are fundamental in the Commission's proposed plan:

1. Provision for light and air is a prime essential in building regulation.
2. Building regulations in each section of the City should be adapted to the requirements of that section.
3. It is desirable as a general rule to treat all buildings in a given block according to a uniform rule. There should be a substantially uniform

contribution from each owner to the light and air of the block. Block ventilation is essential to well ordered development. Rear yards should be required wherever buildings come back to back.

4. A building is usually appropriately located when it is surrounded by buildings of similar type and use. Order in building development is essential to the health, safety and comfort of the public and far from depressing values or working hardship to property owners generally, will actually conserve and enhance values.

5. The residence sections should be protected against unnecessary invasion by commercial and industrial uses.

6. The present congested condition in lower Manhattan constitutes a serious danger to life and property. Street congestion may interfere seriously with the movement of fire apparatus. The occupants of high office and loft buildings may be endangered by fire and panic.

These and other considerations advanced in the Commission's report prove the urgent need for the adoption of a districting plan. The official duties of the members of this subcommittee bring to their notice the irreparable injury that almost daily is being brought about by the erection of inappropriate buildings or the establishment of business uses in residence sections. The remedy proposed is timely and appears to have been most carefully worked out.

Your subcommittee was directed to consider the resolution with special reference to Article IV, containing the general and administrative provisions. The Committee has not had an opportunity to take up in detail the other articles of the resolution.

The subcommittee recommends the approval of Article IV with the following changes:

New words and phrases added by the subcommittee are in italics. Words and phrases recommended for omission are included in brackets.

Section 14. Existing Buildings and Uses: Nothing herein contained shall require any change in the plans or construction of a building or in its designated use for which a permit has been heretofore approved or plans for which are on file *in the office of the superintendent of buildings or of the Tenement House Department* [with the building superintendent] at the time of the passage of this resolution and a permit therefor is issued within three months of the passage of this resolution and the construction of which is diligently prosecuted within a year of the date of [such] *the* permit *issued by the building superintendent* and at least the whole ground story of which shall have been completed within such year and the complete erection of the building as planned shall have been effected within five years from the date of passage of this resolution.

Except as otherwise provided in Section 3-a, if a structure or building now existing shall hereafter be wholly or in part removed or destroyed whatsoever may be the cause, purpose or manner of its removal or destruction, it shall not be rebuilt or restored unless it conforms with the provisions herein prescribed; but nothing in this resolution shall prevent the restoration of a building or industrial plant which is damaged less than 50 per cent of its structural parts or the restoration of a wall declared unsafe by the superintendent of buildings *or by a board of survey as provided in the Building Code.* No building now existing or hereafter erected shall be so altered or enlarged as to bring it in violation of any of the provisions of this resolution, nor shall any lot area be so reduced or diminished that the unoccupied areas shall be less than required by this resolution. When additional stories for which plans have not been filed at the time of passage

of this resolution are added in the future to existing buildings, the requirements of this resolution as to setbacks shall start at the top of the existing walls, if they are over the prescribed height limit, and the least dimensions of yards and courts shall be computed from the top of the existing yard or court walls as though they were of the prescribed sizes at such heights and the carrying up of existing elevator and stair enclosures shall be exempted from such provisions.

Section 15. Unlawful Use; Certificate of Occupancy: It shall be unlawful to use or permit the use of any building or premises hereafter created, erected, altered, changed or converted wholly or partly in its use until a certificate to the effect that said [structure] building *or* premises [or place] and the use thereof conforms to all of the requirements of this resolution shall have been issued by the superintendent of buildings of the borough in which said building or premises are located. It shall be the duty of the superintendent of buildings to issue a certificate of use within [20] *10* days after a request for the same shall be filed in his bureau by any owner of a [structure] building or premises affected by this resolution, provided said building or premises conforms with all the requirements herein set forth. It is provided, however, that in the case of tenement houses such certificate of occupancy shall be issued by the tenement house commissioner.

Section 16. Enforcement, Legal Procedure, Penalties: This resolution shall be enforced by the tenement house commissioner, the fire commissioner and by the superintendent of buildings in each borough under the rules and regulations of the Board of Standards and Appeals. The superintendent of buildings shall in each borough enforce the provisions herein contained in so far as such enforcement can be effected through the issue of the building permit and the certificate of occupancy. The fire commissioner shall en force the provisions herein contained in so far as they relate to use of buildings or premises. The tenement house commissioner shall [subject to the rules and regulations of the Board of Standards and Appeals] have [exclusive] jurisdiction to enforce the provisions herein contained in so far as they affect or relate to tenement houses. Any and every violation of the provisions of this resolution or of the rules and regulations adopted thereunder shall subject the owner, agent, contractor, lessee or tenant of a building or premises where such violation has been committed or shall exist, and the agent, architect, builder, contractor, or any other person who has assisted in the commission of such violation or who maintains any building or premises in which such violation exists as to the same legal procedure and the same penaltes as are prescribed in any law, statute, or ordinance for the violations of the Building Code, and such violations shall be subject to the same legal remedies and prosecuted in the same manner prescribed in any law or ordinance for violations of said Building Code.

Section 17. No change.

Section 18. No change.

Section 19. Interpretation; Purpose: In interpreting and applying the provisions of this resolution, they shall be held to be the minimum requirements adopted for the promotion of the public health, safety, comfort, convenience and general welfare. It is not intended by this resolution to interfere with or abrogate or annul any rules, regulations or permits previously adopted or issued or which shall be adopted or issued pursuant to law [by the fire department or health department] relating to the use of buildings or premises; nor is it intended by this resolution to interfere with or abrogate or annul any easements, covenants or other agreements between

parties; provided, however, that where this resolution imposes a greater restriction upon the use of buildings or premises or upon the height of buildings or requires larger open spaces than are imposed or required by such rules, regulations or permits or by such easements, covenants or agreements, the provisions of this resolution shall control.

Section 20. Omit as unnecessary.

Renumber Section 21 as Section 20.

On behalf of the subcommittee, respectfully submitted,

(Sgd.) RUDOLPH MILLER, Engineer, Committee on Buildings, Chairman.

[NOTE—The membership of the subcommittee consisted of Rudolph Miller, Chairman; the tenement house commissioner, the fire commissioner, the superintendent of buildings of each borough, John P. OBrien, assistant corporation counsel, and the consultant and secretary of the Committee on the City Plan of the Board.]

APPENDIX VII.—BUILDING ZONE RESOLUTION

(Adopted July 25, 1916)

A RESOLUTION regulating and limiting the height and bulk of buildings hereafter erected and regulating and determining the area of yards, courts and other open spaces, and regulating and restricting the location of trades and industries and the location of buildings designed for specified uses and establishing the boundaries of districts for the said purposes.

Be it resolved by the Board of Estimate and Apportionment of The City of New York:

ARTICLE I—DEFINITIONS

§ 1. *Definitions.* Certain words in this resolution are defined for the purposes thereof as follows:

(a) Words used in the present tense include the future; the singular number includes the plural and the plural the singular; the word "lot" includes the word "plot"; the word "building" includes the word "structure."

(b) The "street line" is the dividing line between the street and the lot.

(c) The "width of the street" is the mean of the distances between the sides thereof within a block. Where a street borders a public place, public park or navigable body of water the width of the street is the mean width of such street plus the width, measured at right angles to the street line, of such public place, public park or body of water.

(d) The "curb level," for the purpose of measuring the height of any portion of a building, is the mean level of the curb in front of such portion of the building. But where a building is on a corner lot the curb level is the mean level of the curb on the street of greatest width. If such greatest width occurs on more than one street the curb level is the mean level of the curb on that street of greatest width which has the highest curb elevation. The "curb level" for the purpose of regulating and determining the area of yards, courts and open spaces is the mean level of the curb at that front of the building where there is the highest curb elevation. Where no curb elevation has been established or the building does not adjoin the street the average ground level of the lot shall be considered the curb level.

(e) A "street wall" of a building, at any level, is the wall or part of the building nearest to the street line.

(f) The "height of a building" is the vertical distance measured in the case of flat roofs from the curb level to the level of the highest point of the roof beams adjacent to the street wall, and in the case of pitched roofs from the curb level to the mean height level of the gable. Where no roof beams exist or there are structures wholly or partly above the roof the height shall be measured from the curb level to the level of the highest point of the building. Where a building is a tenement house as defined in the Tenement House Law the height of the building on the street line shall be measured as prescribed in said law for the measurement of the height of a tenement house and such measurement shall be from the curb level as that term is used in said law.

(g) The "depth of a lot" is the mean distance from the street line of the lot to its rear line measured in the general direction of the side lines of the lot.

(h) A " rear yard " is an open, unoccupied space on the same lot with a building between the rear line of the building and the rear line of the lot.

(i) The " depth of a rear yard " is the mean distance between the rear line of the building and the rear line of the lot.

(j) Lots or portions of lots shall be deemed " back to back " when they are on opposite sides of the same part of a rear line common to both and the opposite street lines on which the lots front are parallel wiht each other or make an angle with each other of not over 45 degrees.

(k) A " court " is an open, unoccupied space, other than a rear yard, on the same lot with a building. A court not extending to the street or to a rear yard is an " inner court." A court extending to the street or a rear yard is an " outer court." A court on the lot line extending through from the street to a rear yard or another street is a " side yard."

(l) The " height of a yard or a court " at any given level shall be measured from the lowest level of such yard or court as actually constructed or from the curb level, if higher, to such level. The highest level of any given wall bounding a court or yard shall be deemed to be the mean height of such wall. Where a building is a tenement house, as defined in the Tenement House Law, the height of a yard or a court shall be measured as prescribed in such law.

(m) The " least dimension " of a yard or court at any level is the least of the horizontal dimensions of such yard or court at such level. If two opposite sides of a yard or court are not parallel the horizontal dimension between them shall be deemed to be the mean distance between them.

(n) The " length of an outer court " at any given point shall be measured in the general direction of the side lines of such court from the end opposite the end opening on a street, or a rear yard, to such point.

Article II—Use Districts

§ 2. *Use Districts.* For the purpose of regulating and restricting the location of trades and industries and the location of buildings designed for specified uses, the City of New York is hereby divided into three classes of districts: (1) residence districts, (2) business districts, and (3) unrestricted districts; as shown on the use district map which accompanies this resolution and is hereby declared to be part hereof. The use districts designated on said map are hereby established. The use district map designations and map designation rules which accompany said use district map are hereby declared to be part thereof. No building or premises shall be erected or used for any purpose other than a purpose permitted in the use district in which such building or premises is located.

§ 3. *Residence Districts.* In a residence district no building shall be erected other than a building, with its usual accessories, arranged, intended or designed exclusively for one or more of the following specified uses:

(1) Dwellings, which shall include dwellings for one or more families and boarding houses and also hotels which have thirty or more sleeping rooms.

(2) Clubs, excepting clubs the chief activity of which is a service customarily carried on as a business.

(3) Churches.

(4) Schools, libraries or public museums.

(5) Philanthropic or eleemosynary uses or institutions, other than correctional institutions.

(6) Hospitals and sanitariums.
(7) Railroad passenger stations.
(8) Farming, truck gardening, nurseries or green houses.

In a residence district no building or premises shall be used for any use other than a use above specified for which buildings may be erected and for the accessory uses customarily incident thereto. The term accessory use shall not include a business nor shall it include any building or use not located on the same lot with the building or use to which it is accessory. A private garage for more than five motor vehicles shall not be deemed an accessory use.

§ 4. *Business Districts.* (a) In a business district no building or premises shall be used, and no building shall be erected which is arranged, intended or designed to be used, for any of the following specified trades, industries or uses:

Ammonia, chlorine or bleaching powder manufacture.
Asphalt manufacture or refining.
Assaying (other than gold or silver).
Blacksmithing or horseshoeing.
Boiler making.
Brewing or distilling of liquors.
Carpet cleaning.
Celluloid manufacture.
Crematory.
Distillation of coal, wood or bones.
Dyeing or dry cleaning.
Electric central station power plant.
Fat rendering.
Fertilizer manufacture.
Garage for more than five motor vehicles, not including a warehouse where motor vehicles are received for dead storage only, and not including a salesroom where motor vehicles are kept for sale or for demonstration purposes only.
Gas (illuminating or heating) manufacture or storage.
Glue, size and gelatine manufacture.
Incinerator or reduction of garbage, offal, dead animals or refuse.
Iron, steel, brass or copper works.
Junk, scrap paper or rag storage or baling.
Lamp black manufacture.
Lime, cement or plaster of Paris manufacture.
Milk bottling and distributing station.
Oil cloth or linoleum manufacture.
Paint, oil, varnish or turpentine manufacture.
Petroleum refining or storage.
Printing ink manufacture.
Raw hides or skins—storage, curing or tanning.
Repair shop for motor vehicles.
Rubber manufacture from the crude material.
Saw or planing mill.
Shoddy manufacture or wool scouring.
Slaughtering of animals.
Smelting.
Soap manufacture.
Stable for more than five horses.

Starch, glucose or dextrine manufacture.
Stock yards.
Stone or monumental works.
Sugar refining.
Sulphurous, sulphuric, nitric or hydrochloric acid manufacture.
Tallow, grease or lard manufacturing or refining.
Tar distillation or manufacture.
Tar roofing or tar waterproofing manufacture.

(b) In a business district no building or premises shall be used, and no building shall be erected, which is arranged, intended or designed to be used for any trade, industry or use that is noxious or offensive by reason of the emission of odor, dust, smoke, gas or noise; but car barns or places of amusement shall not be excluded.

(c) In a business district no building or premises shall be used, and no building shall be erected, which is arranged, intended or designed to be used for any kind of manufacturing, except that any kind of manufacturing not included within the prohibitions of paragraphs a and b of this section may be carried on provided not more than 25 per cent of the total floor space of the building is so used, but space equal to the area of the lot may be so used in any case, although in excess of said 25 per cent. The printing of a newspaper shall not be deemed manufacturing. No use permitted in a residence district by section 3 shall be excluded from a business district.

§ 5. *Unrestricted Districts.* The term "unrestricted district' is used to designate the districts for which no regulations or restrictions are provided by this article.

§ 6. *Existing Buildings and Premises.* In any building or premises any lawful use existing therein at the time of the passage of this resolution may be continued therein, although not conforming to the regulations of the use district in which it is maintained, or such use may be changed or converted or extended throughout the building, provided, in either case, that no structural alterations, except as required by existing laws and ordinances, are made therein and no new building is erected, and provided further that:

(1) In a residence district no building or premises unless now devoted to a use that is by section 4 prohibited in a business district, shall be converted to such use; and

(2) In a residence or business district no building or premises unless now devoted to a use that is by paragraph a or b of section 4 prohibited in a business district shall be converted to such use.

No existing building designed, arranged, intended or devoted to a use not permitted by this article in the district in which such use is located shall be enlarged, extended, reconstructed or structurally altered unless such use is changed to a use permitted in the district in which such building is located; except that such building may be reconstructed or structurally altered to an extent not greater than 50 per cent of the value of the building, exclusive of foundations, for the purpose of continuing therein, without any extension thereof, a lawful use existing therein at the time of the passage of this resolution, and such use may be continued therein, although not conforming to the regulations of the use district in which it is maintained.

§ 7. *Use District Exceptions.* The Board of Appeals, created by chapter 503 of the laws of 1916, may, in appropriate cases, after public notice and hearing, and subject to appropriate conditions and safeguards, determine and vary the application of the use district regulations herein established in harmony with their general purpose and intent as follows:

(a) Permit the extension of an existing building and the existing use thereof upon the lot occupied by such building at the time of the passage of this resolution or permit the erection of an additional building upon a lot occupied at the time of the passage of this resolution by a commercial or industrial establishment and which additional building is a part of such establishment;

(b) Where a use district boundary line divides a lot in a single ownership at the time of the passage of this resolution, permit a use authorized on either portion of such lot to extend to the entire lot, but not more than 25 feet beyond the boundary line of the district in which such use is authorized;

(c) Permit the extension of a building into a more restricted district under such conditions as will safeguard the character of the more restricted district;

(d) Permit in a residence district a central telephone exchange or any building or use in keeping with the uses expressly enumerated in section 3 as the purposes for which buildings or premises may be erected or used in a residence district;

(e) Permit in a business district the erection of a garage or stable in any portion of a street between two intersecting streets in which portion or block there exists a public garage or public stable at the time of the passage of this resolution;

(f) Grant in undeveloped sections of the city temporary and conditional permits for not more than two years for structures and uses in contravention of the requirements of this article.

Article III—Height Districts

§ 8. *Height Districts.* For the purpose of regulating and limiting the height and bulk of buildings hereafter erected, the City of New York is hereby divided into five classes of districts: (a) one times districts, (b) one and one-quarter times districts, (c) one and one-half times districts, (d) two times districts, (e) two and one-half times districts; as shown on the height district map which accompanies this resolution and is hereby declared to be part hereof. The height districts designaed on said map are hereby established. The height district map designations and map designation rules which accompany said height district map are hereby declared to be part thereof. No building or part of a building shall be erected except in conformity with the regulations herein prescribed for the height district in in which such building is located.

(a) In a one times district no building shall be erected to a height in excess of the width of the street, but for each one foot that the building or a portion of it sets back from the street line two feet shall be added to the height limit of such building or such portion thereof.

(b) In a one and one-quarter times district no building shall be erected to a height in excess of one and one-quarter times the width of the street, but for each one foot that the building or a portion of it sets back from the street line two and one-half feet shall be added to the height limit of such building or such portion thereof.

(c) In a one and one-half times district no building shall be erected to a height in excess of one and one-half times the width of the street, but for each one foot that the building or a portion of its sets back from the street line three feet shall be added to the height limit of such building or such portion thereof.

(d) In a two times district no building shall be erected to a height in excess of twice the width of the street, but for each one foot that the building or a portion of it sets back from the street line four feet shall be added to the height limit of such building or such portion thereof.

(e) In a two and one-half times district no building shall be erected to a height in excess of two and one-half times the width of the street, but for each one foot that the building or a portion of its sets back from the street line five feet shall be added to the height limit of such building or such portion thereof.

§ 9. *Height District Exceptions.* (a) On streets less than 50 feet in width the same height regulations shall be applied as on streets 50 feet in width and, except for the purposes of paragraph d of this section, on streets more than 100 feet in width the same height regulations shall be applied as on streets 100 feet in width.

(b) Along a narrower street near its intersection with a wider street, any building or any part of any building fronting on the narrower street within 100 feet, measured at right angles to the side of the wider street, shall be governed by the height regulations provided for the wider street. A corner building on such intersecting streets shall be governed by the height regulations provided for the wider street for 150 feet from the side of such wider street, measured along such narrower street.

(c) Above the height limit at any level for any part of a building a dormer, elevator bulkhead or other structure may be erected, provided its frontage length on any given street be not greater than 60 per cent of the length of such street frontage of such part of the building. Such frontage length of such structure at any given level shall be decreased by an amount equal to one per cent. of such street frontage of such part of the building for every foot such level is above such height limit. If there are more than one such structures, their aggregate frontage shall not exceed the frontage length above permitted at any given level.

(d) If the area of the building is reduced so that above a given level it covers in the aggregate not more than 25 per cent of the area of the lot, the building above such level shall be excepted from the foregoing provisions of this article. Such portion of the building may be erected to any height, provided that the distance which it sets backs from the street line on each street on which it faces, plus half of the width of the street, equals at least 75 feet. But for each one per cent of the width of the lot on the street line that such street wall is less in length than such width of the lot, such wall may be erected four inches nearer to the street line.

(e) When at the time plans are filed for the erection of a building there are buildings in excess of the height limits herein provided within 50 feet of either end of the street frontage of the proposed building or directly opposite such building across the street, the height to which the street wall of the proposed building may rise shall be increased by an amount not greater than the average excess height of the walls on the street line within 50 feet of either end of the street frontage of the proposed building and at right angles to the street frontage of the proposed building on the opposite side of the street. The average amount of such excess height shall be computed by adding together the excess heights above the prescribed height limit for the street frontage in question of all of the walls on the street line of the buildings and parts of buildings within the above defined frontage and dividing the sum by the total number of buildings and vacant plots within such frontage.

(f) Nothing in this article shall prevent the projection of a cornice beyond the street wall to an extent not exceeding five per cent of the width of the street nor more than five feet in any case. Nothing in this article shall prevent the erection above the height limit of a parapet wall or cornice solely for ornament and without windows extending above such height limit not more than five per cent of such height limit, but such parapet wall or cornice may in any case be at least five and one-half feet high above such height limit.

(g) The provisions of this article shall not apply to the erection of church spires, belfries, chimneys, flues or gas holders.

(h) Where not more than 50 feet of a street frontage would otherwise be subjected to a height limit lower than that allowed immediately beyond both ends of such frontage, the height limit on such frontage shall be equal to the lesser of such greater height limits.

(i) If an additional story or stories are added to a building existing at the time of the passage of this resolution, the existing walls of which are in excess of the height limits prescribed in this article, the height limits for such additional story or stories shall be computed from the top of the existing walls as though the latter were not in excess of the prescribed height limits and the carrying up of existing elevator and stair enclousures shall be exempted from the provisions of this article.

Article IV—Area Districts

§ 10. *Area Districts.* For the purpose of regulating and determining the area of yards, courts and other open spaces for buildings hereafter erected, the City of New York is hereby divided into five classes of area districts: A, B, C, D and E; as shown on the area district map which accompanies this resolution and is hereby declared to be part hereof. The area districts designated on said map are hereby established. The area district map designations and map designation rules which accompany said area district map are hereby declared to be a part thereof. No building or part of a building shall be erected except in conformity with the regulations herein prescribed for the area district in which such building is located. Unless otherwise expressly provided the term rear yard, side yard, outer court or inner court when used in this article shall be deemed to refer only to a rear yard, side yard, outer court or inner court required by this article. No lot area shall be so reduced or diminished that the yards, courts or open spaces shall be smaller than prescribed in this article.

§ 11. *A Districts.* In an A district a court at any given height shall be at least one inch in least dimension for each one foot of such height.

§ 12. *B Districts.* In a B district a rear yard at any given height shall be at least two inches in least dimension for each one foot of such height. The depth of a rear yard at its lowest level shall be at least 10 per cent. of the depth of the lot, but need not exceed 10 feet at such level. An outer court or a side yard at any given height shall be at least one inch in least dimension for each one foot of such height. An outer court at any given point shall be at least one and one-half inches in least dimension for each one foot of length. But for each foot that an outer court at any given height would, under the above rules, be wider in its least dimension for such height than the minimum required by its length, one inch shall be deducted from the required least dimension for such height for each 24 feet of such height. A side yard for its length within 50 feet of the street may for the purposes of the above rule be considered an outer court.

§ 13. *C Districts.* In a C district a rear yard at any given height shall be at least three inches in least dimension for each one foot of such height. The depth of a rear yard at its lowest level shall be at least 10 per cent of the depth of the lot but need not exceed 10 feet at such level. An outer court or a side yard at any given height shall be at least one and one-half inches in least dimension for each one foot of such height. An outer court at any given point shall be at least one and one-half inches in least dimension for each one foot of length. On a lot not more than 30 feet in mean width an outer court or a side yard at any given height shall be not less than one inch in least dimension for each one foot of such height, and an inner court at any given height shall be either (1) not less than two inches in least dimension for each one foot of such height or (2) it shall be of an equivalent area as hereinafter specified in paragraph c of section 17.

(b) If the owner or owners of any part of a C district set aside perpetually for the joint recreational use of the residents of such part designated by them, an area at least equal to 10 per cent. of the area of such part in addition to all yard and court requirements for a B district, such part shall be subject to the regulations herein prescribed for a B district. Such joint recreational space shall be composed of one or more tracts, each of which shall be at least 40 feet in least dimension and 5,000 square feet in area and shall be approved by the Board of Appeals as suitable for the joint recreational use of such residents.

§ 14. *D Districts.* (a) In a D district a rear yard at any given height shall be at least four inches in least dimension for each one foot of such height. The depth of a rear yard at its lowest level shall be at least 10 per cent of the depth of the lot, but need not exceed 10 feet at such level. If a building in a D district is located in a residence district as designated on the use district map, the depth of a rear yard at its lowest level shall be at least 20 per cent. of the depth of the lot, but need not exceed 20 feet at such level. However, for each one foot in excess of 10 feet of the depth of such rear yard at its lowest level, there may be substituted one foot of depth of unoccupied space across the whole width of the front of the lot at the curb level between the street line and the street wall of the building.

(b) In a D district an outer court or a side yard at any given height shall be at least two inches in least dimension for each one foot of such height. An outer court at any given point shall be at least two inches in least dimension for each one foot of length. On a lot not more than 30 feet in mean width an outer court or a side yard at any given height shall be not less than one and one-half inches in least dimension for each one foot of such height. On such lot an outer court at any given point shall be not less than one and one-half inches in least dimension for each one foot of length. On such lot an inner court at any given height shall be either (1) not less than three inches in least dimension for each one foot of such height or (2) it shall be of an equivalent area as specified in paragraph c of section 17.

(c) In a D district no building located within a residence district as designated on the use district map shall occupy at the curb level more than 60 per cent of the area of the lot, if an interior lot, or 80 per cent if a corner lot. In computing such percentage any part of the area of any corner lot in excess of 8,000 square feet shall be considered an interior lot.

(d) If the owner or owners of any part of a D district set aside perpetually for the joint recreational use of the residents of such part designated by them, an area at least equal to 10 per cent of the area of such

part in addition to all yard and court requirements for a C district, such part shall be subject to the regulations herein prescribed for a C district. Such joint recreational space shall be composed of one or more tracts, each of which shall be at least 40 feet in least dimension and 5,000 square feet in area and shall be approved by the Board of Appeals as suitable for the joint recreational use of such residents.

§ 15. *E Districts.* (a) In an E district a rear yard at any given height shall be at least five inches in least dimension for each one foot of such height. The depth of a rear yard at its lowest level shall be at least 15 per cent of the depth of the lot, but need not exceed 15 feet at such level. If a building in an E district is located in a residence district as designated on the use district map, the depth of a rear yard at its lowest level shall be at least 25 per cent of the depth of the lot, but need not exceed 25 feet at such level. However, for each one foot in excess of 10 feet of the depth of such rear yard at its lowest level there may be substituted one foot of depth of unoccupied space across the whole width of the front of the lot at the curb level between the street line and the street wall of the building. In an E district on at least one side of every building located within a residence district there shall be a side yard along the side lot line for the full depth of the lot or back to the rear yard.

(b) In an E district an outer court or side yard at any given height shall be at least two and one-half inches in least dimension for each one foot of such height. On a lot not more than 50 feet in mean width an outer court or a side yard at any given height shall be at least two inches in least dimension for each one foot of such height. An outer court at any given point shall be at least two and one-half inches in least dimension for each one foot of length.

(c) In an E district no building located within a residence district as designated on the use district map shall occupy at the curb level more than 50 per cent of the area of the lot, if an interior lot, or 70 per cent if a corner lot, and above a level 18 feet above the curb no building shall occupy more than 30 per cent of the area of the lot, if an interior lot, or 40 per cent if a corner lot. In computing such percentage any part of the area of any corner lot in excess of 8,000 square feet shall be considered an interior lot.

§ 16. *Rear Yards.* (a) Except in A districts, for lots or portions of lots that are back to back there shall be rear yards extending along the rear lot lines of such lots or portions of lots wherever they are more than 55 feet back from the nearest street. Such rear yard shall be at least of the area and dimensions herein prescribed for the area district in which it is located at every point along such rear lot line. Within 55 feet of the nearest street no rear yards shall be required. No rear yard shall be required on any corner lot nor on the portion of any lot that is back to back with a corner lot.

(b) Where a building is not within a residence district as designated on the use district map, the lowest level of a rear yard shall not be above the sill level of the second story windows, nor in any case more than 23 feet above the curb level. Where a building is within a residence district the lowest level of a rear yard shall not be above the curb level, except that not more than 40 per cent of the area of the yard may be occupied by the building up to a level 18 feet above the curb level. In the case of a church, whether within or without a residence district, such 40 per cent may be occupied up to a level of 30 feet above the curb level.

(c) Chimneys or flues may be erected within a rear yard, provided they do not exceed five square feet in area in the aggregate and do not obstruct ventilation.

(d) Except in A districts, where a building on an interior lot between lots for which rear yards are required runs through the block from street to street or to within 55 feet of another street, there shall be on each side lot line above the sill level of the second story windows and in any case above a level 23 feet above the curb level a court of at least equivalent area at any given height to that required for an inner court at such height and having a least dimension not less than that required for an outer court at the same height.

(e) When a proposed building is on a lot which is back to back with a lot or lots on which there is a building or buildings having rear yards less in depth than would be required under this article, the depth of the rear yard of the proposed building shall not be required to be greater at any given level than the average depth of the rear yards directly back to back with it at such level, but in no case shall the depth of such rear yard be less at any height than the least dimension prescribed for an outer court at such height.

§ 17. *Courts.* (a) If a room in which persons live, sleep, work or congregate receives its light and air in whole or in part directly from an open space on the same lot with the building, there shall be at least one inner court, outer court, side yard or rear yard upon which a window or ventilating skylight opens from such room. Such inner court, outer court or side yard shall be at least of the area and dimensions herein prescribed for the area district in which it is located. Such rear yard shall be at least of the area and dimensions herein prescribed for an inner court in the area district in which it is located. In an A district, such inner court, outer court, side yard or rear yard shall be at least of the area and dimensions herein prescribed for a court in such district. The unoccupied space within the lot in front of every part of such window shall be not less than three feet, measured at right angles thereto. Courts, yards and other open spaces, if provided in addition to those required by this section, need not be of the area and dimensions herein prescribed. The provisions of this section shall not be deemed to apply to courts or shafts for bathrooms, toilet compartments, hallways or stairways.

(b) The least dimension of an outer court, inner court or side yard at its lowest level shall be not less than four feet, except that where the walls bounding a side yard within the lot are not more than 25 feet in mean height and not more than 40 feet in length, such least dimension, except in an E district, may be not less than three feet. Where any outer court opens on a street such street may be considered as part of such court.

(c) The least dimension of an inner court at any given height shall be not less than that which would be required in inches for each one foot of height for a rear yard of the same height, except that an inner court of equivalent area may be substituted for said court, provided that for such area its least dimension be not less than one-half of its greatest dimension. If an inner court is connected with a street by a side yard for each one foot that such side yard is less than 65 feet in depth from the street, one square foot may be deducted from the required area of the inner court for each 15 feet of height of such court. If the lot is not required under this resolution to have a rear yard, an outer court, not opening on a street, shall open at any level on an inner court on the rear line of the lot and such inner court shall be deemed a rear yard in such case.

§ 18. *Area District Exceptions.* (a) The area required in a court or yard at any given level shall be open from such level to the sky unobstructed, except for the ordinary projections of skylights and parapets above the bottom of such court or yard, and except for the ordinary projections of window sills, belt courses, cornices and other ornamental features to the extent of not more than four inches. However, where a side yard or an outer court opens on a street a cornice may project not over five feet into such side yard or outer court within five feet of the street wall of the building.

(b) An open or lattice enclosed iron fire escape, fireproof outside stairway or solid-floored balcony to a fire tower may project not more than four feet into a rear yard or an inner court, except that an open or lattice enclosed iron fire escape may project not more than eight feet into a rear yard or into an inner court when it does not occupy more than 20 per cent of the area of such inner court.

(c) A corner of a court or yard may be cut off between walls of the same building, provided that the length of the wall of such cut-off does not exceed seven feet.

(d) An offset to a court or yard may be considered as a part of such court or yard, provided that it is no deeper in any part than it is wide on the open side and that such open side be in no case less than six feet wide.

(e) If a building is erected on the same lot with another building the several buildings shall, for the purposes of this article, be considered as a single building. Any structure, whether independent of or attached to a building, shall for the purposes of this article be deemed a building or a part of a building.

(f) If an additional story or stories are added to a building existing at the time of the passage of this resolution, the courts and yards of which do not conform to the requirements of this article, the least dimensions of yards and courts shall be increased from the top of the existing yard or court walls, as though they were of the prescribed dimensions at such heights and the carrying up of existing elevator and stair enclosures shall be exempted from the provisions of this article.

Article V—General and Administrative

§ 19. *Interpretation; Purpose.* In interpreting and applying the provisions of this resolution, they shall be held to be the minimum requirements adopted for the promotion of the public health, safety, comfort, convenience and general welfare. It is not intended by this resolution to repeal, abrogate, annul or in any way to impair or interfere with any existing provision of law or ordinance or any rules, regulations or permits previously adopted or issued or which shall be adopted or issued pursuant to law relating to the use of buildings or premises; nor is it intended by this resolution to interfere with or abrogate or annul any easements, covenants or other agreements between parties; provided, however, that where this resolution imposes a greater restriction upon the use of buildings or premises or upon height of buildings or requires larger yards, courts or other open spaces than are imposed or required by such existing provision of law or ordinance or by such rules, regulations or permits or by such easements, covenants or agreements, the provisions of this resolution shall control.

§ 20. *Rules and Regulations; Modifications of Provisions.* The Board of Standards and Appeals, created by chapter 503 of the Laws of 1916, shall adopt from time to time such rules and regulations as they may deem

necessary to carry into effect the provisions of this resolution. Where there are practical difficulties or unnecessary hardships in the way of carrying out the strict letter of the provisions of this resolution the Board of Appeals shall have power in a specific case to vary any such provision in harmony with its general purpose and intent, so that the public health, safety and general welfare may be secured and substantial justice done. Where the street layout actually on the ground varies from the street layout as shown on the use, height or area district map, the designation shown on the mapped street shall be applied by the Board of Appeals to the unmapped streets in such a way as to carry out the intent and purpose of the plan for the particular section in question. Before taking any action authorized in this section the Board of Appeals shall give public notice and hearing.

§ 21. *Unlawful Use; Certificate of Occupancy.* It shall be unlawful to use or permit the use of any building or premises or part thereof hereafter created, erected, changed or converted wholly or partly in its use or structure until a certificate of occupancy to the effect that the building or premises or the part thereof so created, erected, changed or converted and the proposed use thereof conform to the provisions of this resolution shall have been issued by the superintendent of buildings of the borough in which such building or premises is located, or, in the case of a tenement house as defined in the Tenement House Law, by the tenement house commissioner. In the case of such buildings or premises it shall be the duty of the superintendent of buildings or the tenement house commissioner, as the case may be, to issue a certificate of occupancy within ten days after a request for the same shall be filed in his office by any owner of a building or premises affected by this resolution, provided said building or premises, or the part thereof so created, erected, changed or converted, and the proposed use thereof, conforms with all the requirements herein set forth. Under rules and regulations of the Board of Standards and Appeals a temporary certificate of occupancy for a part of a building may be issued by the superintendent of buildings or the tenement house commissioner, as the case may be. Upon written request from the owner, the superintendent of buildings or the tenement house commissioner, as the case may be, shall issue a certificate of occupancy for any building or premises existing at the time of the passage of this resolution certifying after inspection the use of the building or premises and whether such use conforms to the provisions of this resolution.

§ 22. *Enforcement, Legal Procedure, Penalties.* This resolution shall be enforced by the tenement house commissioner, the fire commissioner and by the superintendent of buildings in each borough under the rules and regulations of the Board of Standards and Appeals. The tenement house commissioner shall enforce the provisions herein contained in so far as they affect or relate to tenement houses as defined by the Tenement House Law. The superintendent of buildings shall in each borough enforce the provisions herein contained in so far as they relate to buildings or premises other than tenement houses. The fire commissioner shall enforce the provisions herein contained in so far as they relate to the use of completed buildings or premises, or part thereof, other than tenement houses. For any and every violation of the provisions of this resolution or of the rules and regulations adopted thereunder, the owner, general agent or contractor of a building or premises where such violation has been committed or shall exist, and the lessee or tenant of an entire building or entire premises where such violation has been committed or shall exist, and the owner, general agent, contractor,

lessee or tenant of any part of a building or premises in which part such violation has been committed or shall exist, and the general agent, architect, builder, contractor or any other person who commits, takes part or assists in such violation or who maintains any building or premises in which any such violation shall exist, shall be liable to the same legal procedure and the same penalties as are prescribed in any law, statute or ordinance for violations of the Building Code, and for such violations the same legal remedies shall be had and they shall be prosecuted in the same manner as prescribed in any law or ordinance in the case of violations of said Building Code.

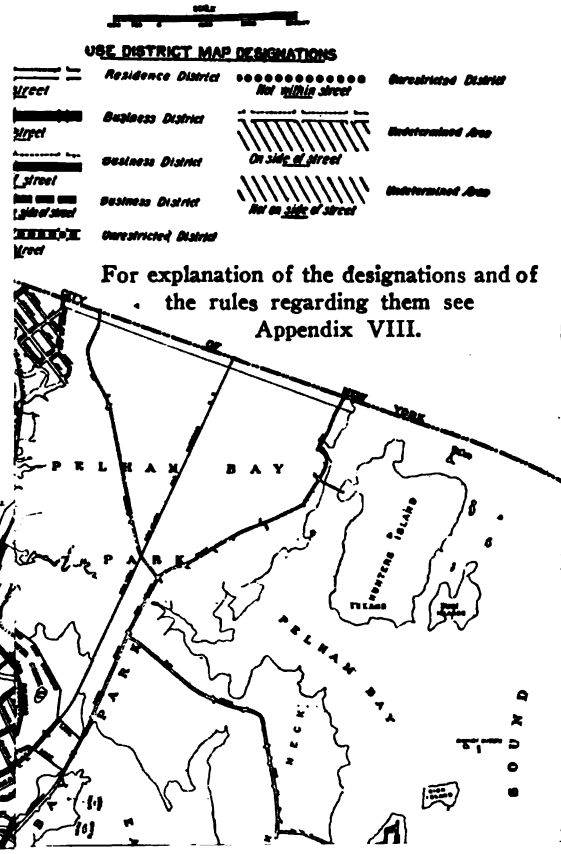
§ 23. *Amendments, Alterations and Changes in District Lines.* The Board of Estimate and Apportionment may from time to time on its own motion or on petition, after public notice and hearing, amend, supplement or change the regulations and districts herein established. Whenever the owners of 50 per cent or more of the frontage in any district or part thereof shall present a petition duly signed and acknowledged to the Board of Estimate and Apportionment requesting an amendment, supplement, change or repeal of the regulations prescribed for such district or part thereof, it shall be the duty of the Board to vote upon said petition within 90 days after the filing of the same by the petitioners with the secretary of the Board. If, however, a protest against such amendment, supplement or change be presented, duly signed and acknowledged by the owners of 20 per cent or more of any frontage proposed to be altered, or by the owners of 20 per cent of the frontage immediately in the rear thereof, or by the owners of 20 per cent of the frontage directly opposite the frontage proposed to be altered, such amendment shall not be passed except by the unanimous vote of the Board. If any area is hereafter transferred to another district by a change in district boundaries by an amendment, as above provided, the provisions of this resolution in regard to buildings or premises existing at the time of the passage of this resolution shall apply to buildings or premises existing at the time of passage of such amendment in such transferred area.

§ 24. *Completion and Restoration of Existing Buildings.* (a) Nothing herein contained shall require any change in the plans, construction or designated use of a building for which a building permit has been heretofore issued, or plans for which are on file with the building superintendent or with the tenement house department at the time of the passage of this resolution, and a permit for the erection of which is issued within three months of the passage of this resolution and the construction of which, in either case shall have been diligently prosecuted within a year of the date of such permit, and the ground story framework of which, including the second tier of beams, shall have been completed within such year, and which entire building shall be completed according to such plans as filed within five years from the date of the passage of this resolution.

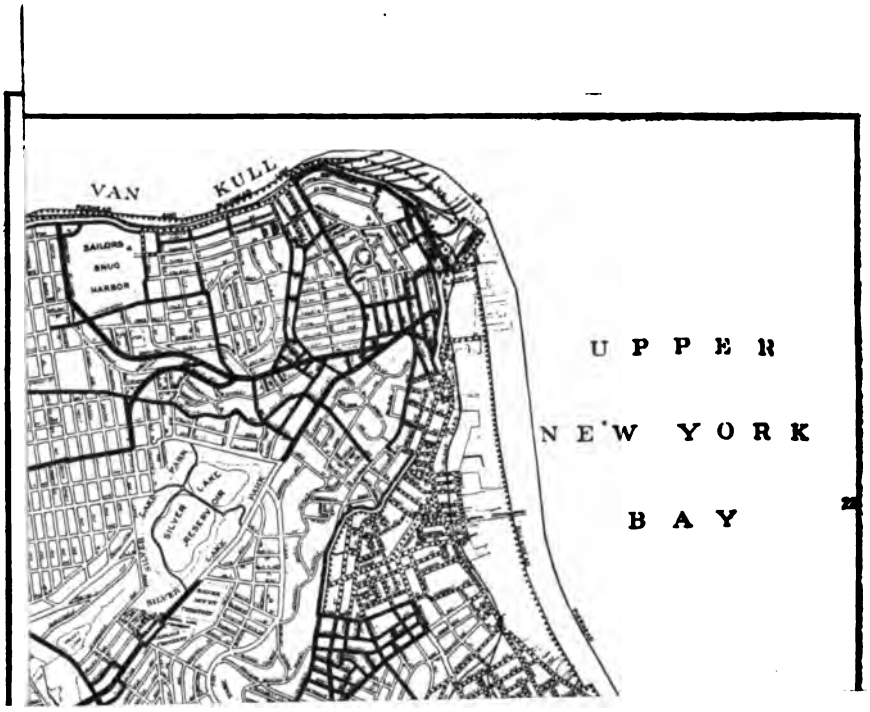
(b) Nothing in this resolution shall prevent the restoration of a building wholly or partly destroyed by fire, explosion, act of God or act of the public enemy or prevent the continuance of the use of such building or part thereof as such use existed at the time of such destruction of such building or part thereof or prevent a change of such existing use under the limitations provided in Section 6. Nothing in this resolution shall prevent the restoration of a wall declared unsafe by the superintendent of buildings or a board of survey.

§ 25. *When Effective.* This resolution shall take effect immediately.

CITY OF NEW YORK
OF ESTIMATE AND APPORTIONMENT
USE DISTRICT MAP
OF THE
BOROUGH OF THE BRONX
ADOPTED JULY 25, 1916



CEDAR GROVE CEMETERY
PARENTAL HOME


VAN KULL
SAILORS SNUG HARBOR
SILVER LAKE RESERVOIR
UPPER NEW YORK BAY

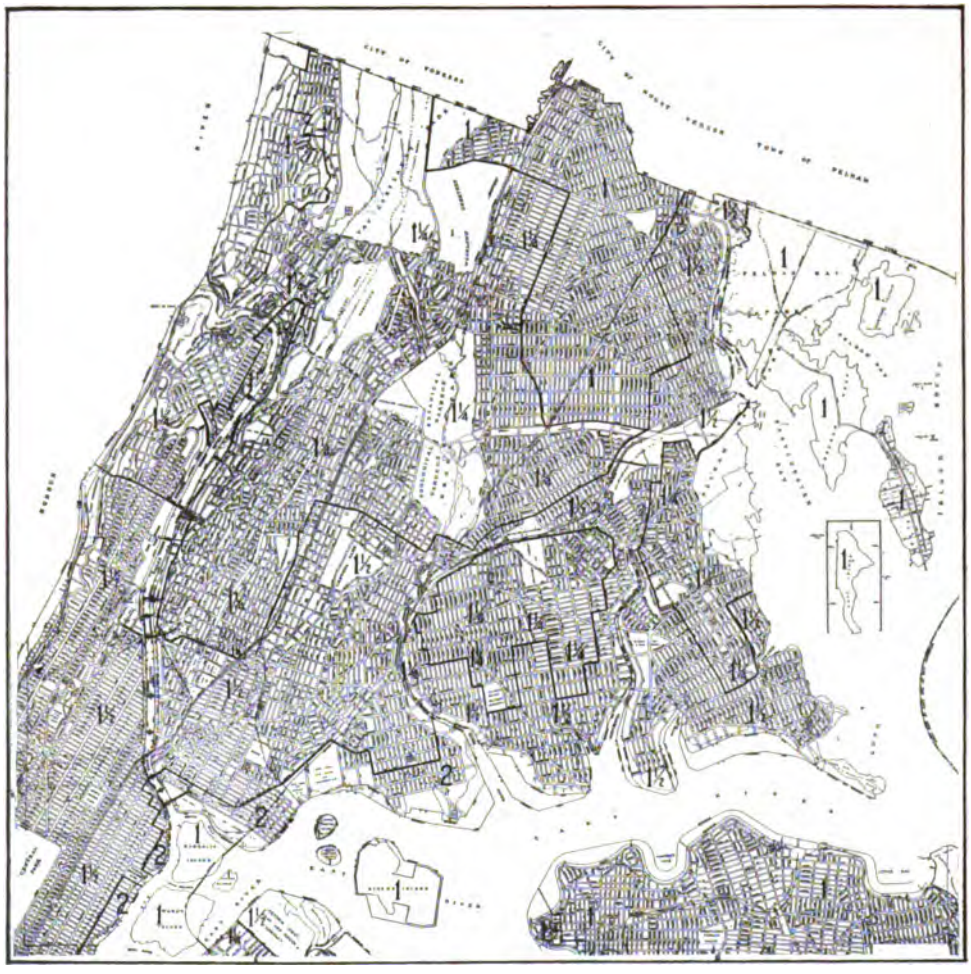


FIG. 129—HEIGHT DISTRICT MAP OF THE BOROUGH OF THE BRONX.

Adopted July 25, 1916, by the Board of Estimate and Apportionment.
For explanation of the designations and of the rules regarding them see Appendix VIII.

CITY OF NEW YORK

BOARD OF ESTIMATE AND APPORTIONMENT

HEIGHT DISTRICT MAP

OF THE

BOROUGHS OF BROOKLYN AND QUEENS

Adopted July 25, 1916

For explanation of the designations and the rules regarding them see Appendix VIII.

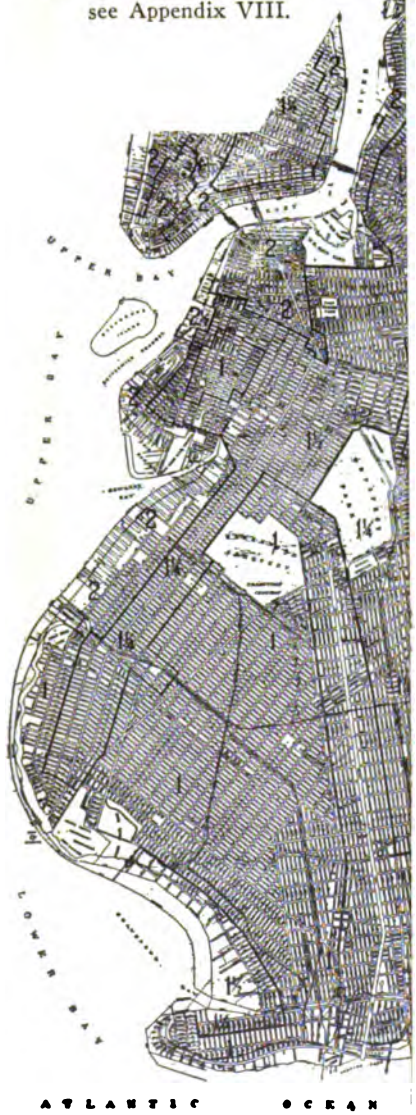


FIG. 131—HEIGHT DISTRICT MAP OF THE BOROUGH OF RICHMOND.

Adopted July 25, 1916, by the Board of Estimate and Apportionment.
For explanation of the designations and of the rules regarding them see Appendix VIII.

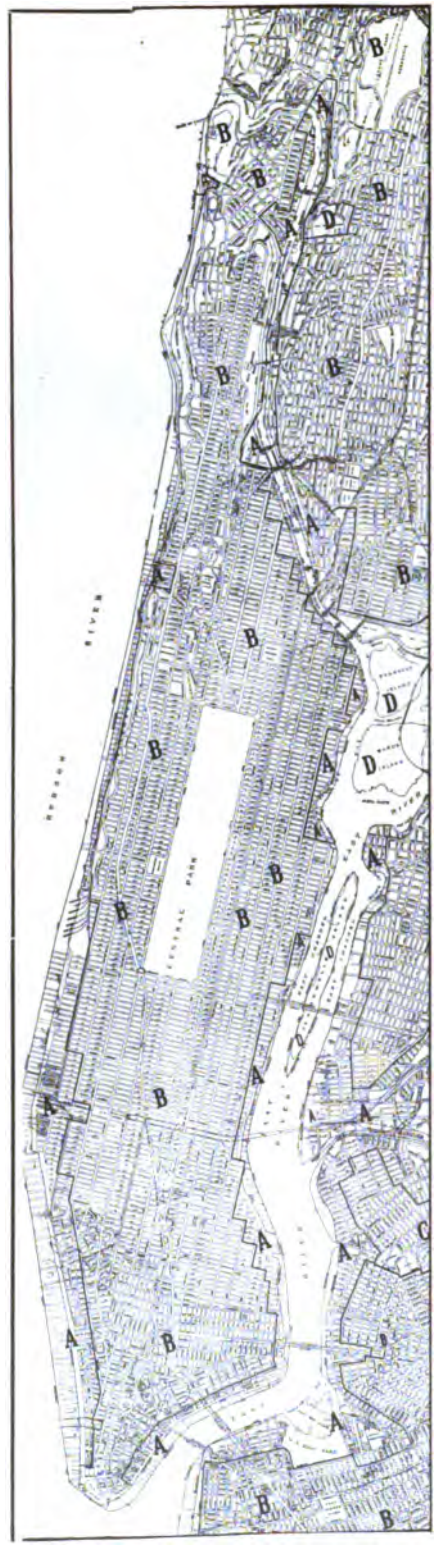


FIG. 132—AREA DISTRICT MAP OF THE BOROUGH OF MANHATTAN.

Adopted July 25, 1916, by the Board of Estimate and Apportionment.
For explanation of the designations and of the rules regarding them see Appendix VIII.

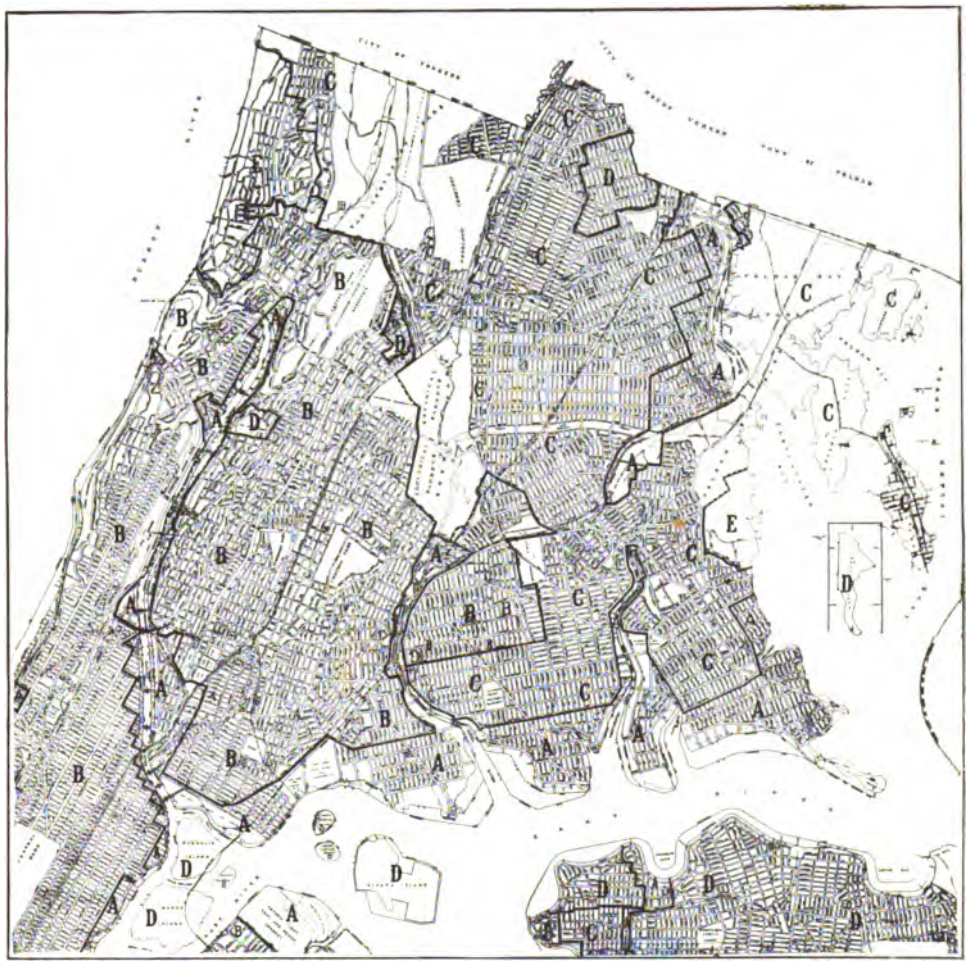


FIG. 133—AREA DISTRICT MAP OF THE BOROUGH OF THE BRONX.

Adopted July 25, 1916, by the Board of Estimate and Apportionment.
For explanation of the designations and of the rules regarding them see Appendix VIII.

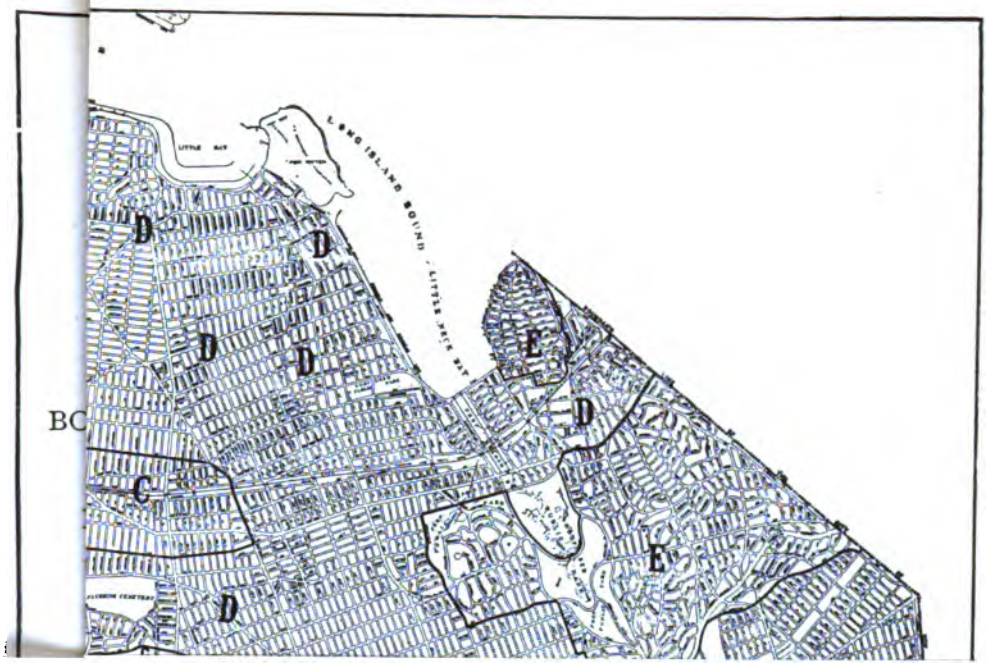
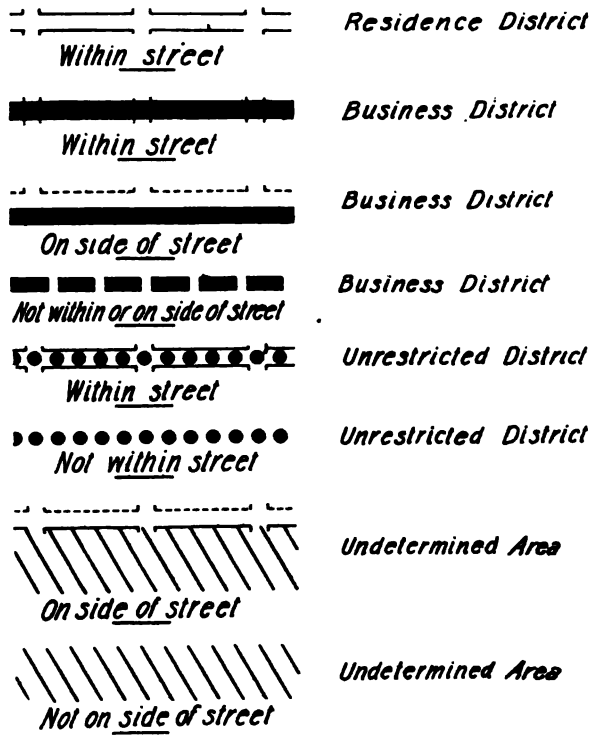

LITTLE BAY
LONG ISLAND SOUND - LITTLE NECK BAY
D
D
D
D
E
D
BC
C
E
D

FIG. 135—AREA DISTRICT MAP OF THE BOROUGH OF RICHMOND.

Adopted July 25, 1916, by the Board of Estimate and Apportionment.
For explanation of the designations and of the rules regarding them see Appendix VIII.

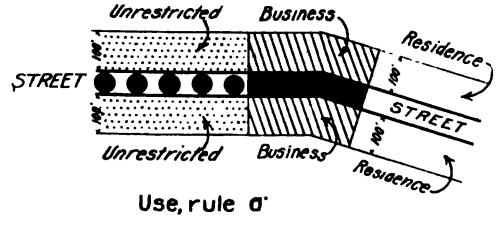
APPENDIX VIII.—MAP DESIGNATIONS AND MAP DESIGNATION RULES ACCOMPANYING BUILDING ZONE RESOLUTION, ADOPTED JULY 25, 1916

Use District Map Designations



Use District Map Designation Rules.

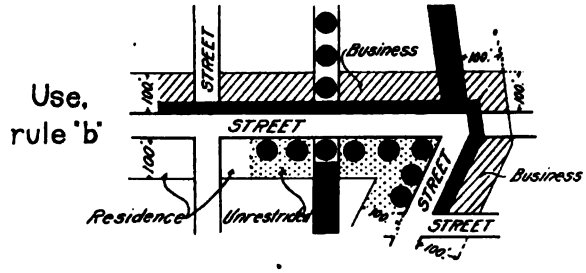
(a) The use district designated within a street shall include the areas adjoining the portion of the street so designated on each side of such street, between such street and lines parallel to and 100 feet distant measured at right angles from each side of such street and limited at either end by lines



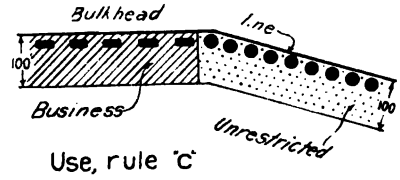
Use, rule a

at right angles to such street at the termination of such designation; except that where there is a cross street on either side at such termination, such limiting line shall follow the center line of such cross street.

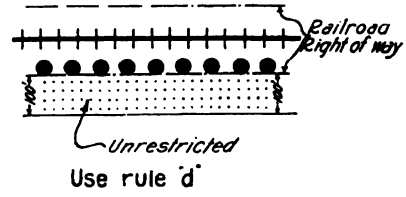
(b) The use district designated on the side of a street shall include the area on such side of the street adjoining the portion thereof so designated between such side of such street and lines parallel thereto and 100 feet distant therefrom, measured at right angles thereto, and limited at either end by lines at right angles to such designated side of such street at the termination of such designation; except that where there is a cross street at such termination the limiting line shall follow the center line of such cross street.



(c) The use district designated on the side of bulkhead lines, shore lines, boundary lines of a state, city, county, borough, United States reservation, public park or cemetery, shall include the area on the side of such lines so designated and adjoining the portion thereof so designated between such lines and lines parallel thereto and 100 feet distant therefrom, measured at right angles thereto, and limited at either end by lines at right angles to such lines so designated at the termination of such designation; except that where there is a cross street at such termination the limiting line shall follow the center line of such street.

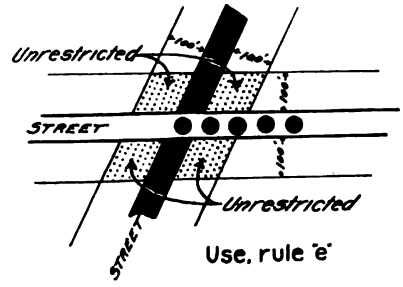


(d) The use district designated on the side of a railroad shall include the area on such side of the right of way of such railroad adjoining the portion so designated between such side of such right of way and lines parallel thereto and 100 feet distant therefrom, measured at right angles

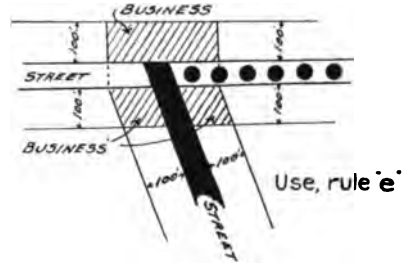


thereto, and limited at either end by lines at right angles to such side of such right of way at the termination of such designation; except that where there is a cross street at such termination the limiting line shall follow the center line of such street.

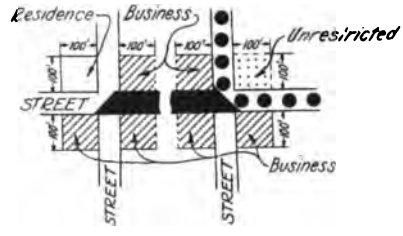
(e) Where a single use district designation is shown within the intersection of two or more streets the district so designated shall include the areas between the sides of such intersecting streets and lines parallel to and 100 feet distant from the sides of each of any two intersecting streets, measured at right angles thereto.



(e) (Continued) When, however, none of the intersecting streets continue across the intersection beyond one of said intersecting streets, the district designated in the intersection shall include the area adjoining the intersection on the uncrossed side of the latter street bounded by such side of such latter street and a line parallel thereto and 100 feet distant therefrom, measured at right angles thereto and by lines at right angles to the crossed side of such latter street at the corners farthest from the intersection of the areas at the street front on the crossed side which are governed by the above rule. Rule (e) shall control regardless of any designation within any of the intersecting streets; except that a designation on the side of a street shall control as provided in rule (b).



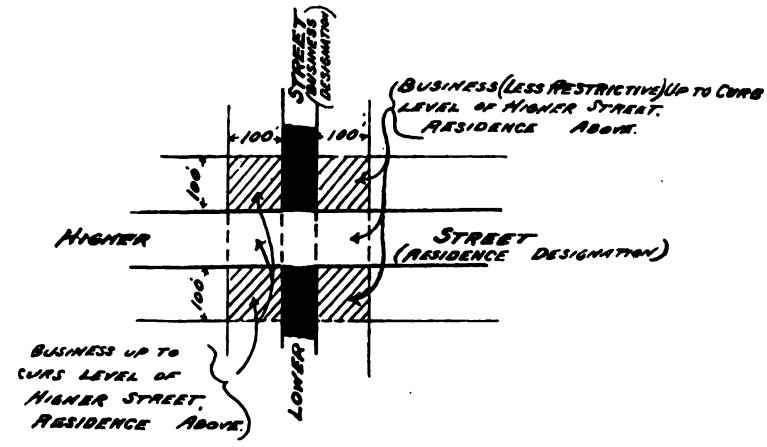
(f) Where one use district designation is shown in one part of a street intersection and another designation is shown in another part, each designa-

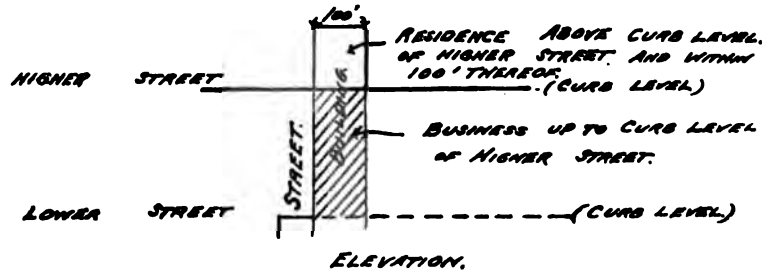


Use, rule "f"

tion in the intersection shall govern as provided in rule (e), but only within those blocks actually touched by such designation in the intersection.

(g) Where two streets cross each other at different levels and the use district designations within the two streets are different, the designation in the lower street shall govern the use of the adjoining areas according to rule (a), but if such use is less restrictive than that designated within the street at the upper level, the designation in the latter street shall govern exclusively above the curb level of the upper street, as provided in rule (a).

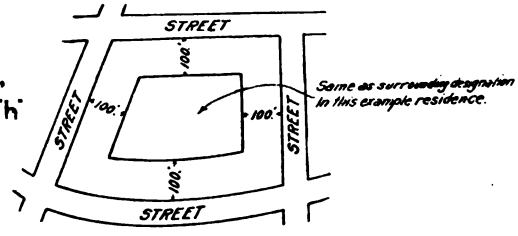




Use, rule "g"

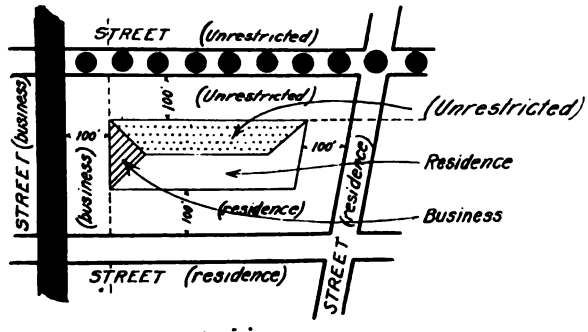
(h) A single use district designation completely surrounding an area shall govern the use of such area, except where such area or a part thereof is otherwise specifically indicated.

Use, rule "h"



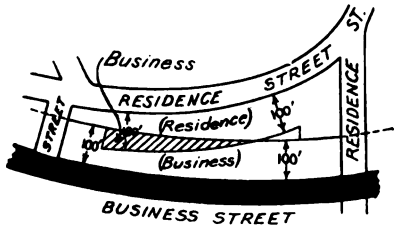
(i) An island not otherwise designated is an undetermined area.

(j) The use of any part of an area bounded by two or more district designations, or any area or part thereof not governed by express provision of these rules, shall be governed by the district designation nearest thereto, except where otherwise specifically indicated.

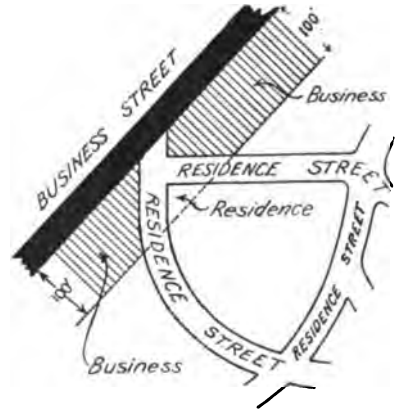


Use, rule "j"

(k) Where under the preceding rules a use district of one class would overlap a use district of another class, the area that would be common to both districts under the above rules shall be included in the district having the less restrictive regulations, but the area so included shall not extend across a street within which a more restrictive district designation is shown.



Use, rule "k"

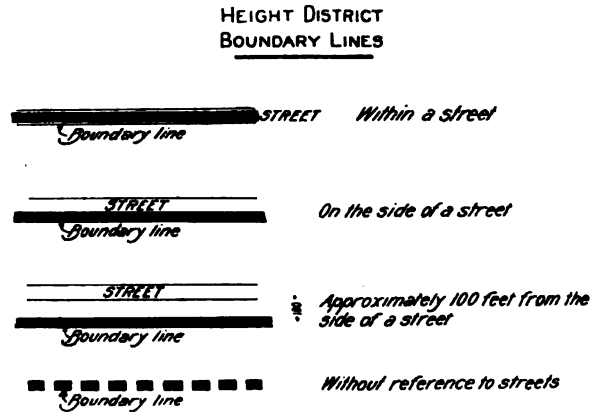


Use, rule "k"

(l) The residence district designation is used within street lines only. A street shown by double, light, short, dash lines shall not be regarded as containing a residence district designation. Street lines with blank space within them do not constitute a residence district designation when located within an undetermined area. A blank space occupying the whole or a part of a street intersection shall be considered a residence district designation only when it is a continuation of a residence district designation shown

within a street entering such intersection, and only when no unrestricted district designation therein is a continuation of an unrestricted district designation shown within a street entering such intersection.

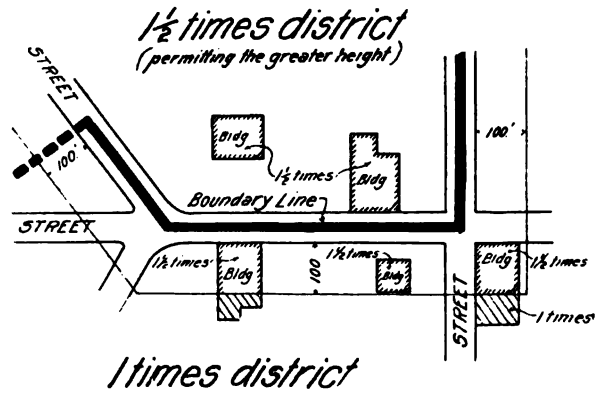
Height District Map Designations



Height District Map Designation Rules

(a) An area surrounded by a district boundary line shall be in the height district designated therein, except as otherwise provided by these rules.

(b) Where a district boundary line between any two height districts is shown within a street or streets, the district permitting the greater height shall extend across such street or streets so as to include the area between the further side of such street or streets and lines parallel thereto and 100

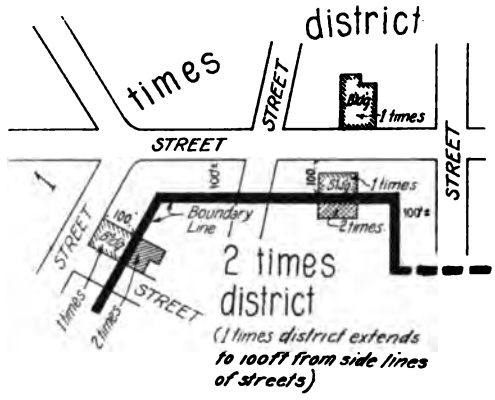


Height, rule "b"

feet distant therefrom, measured at right angles thereto. But such extended area of such district shall be limited where such boundary line passes from

within a street to outside a street by the center line of the cross street when such change takes place in a cross street, otherwise by a line at right angles to the side of such street with boundary line therein at point of change.

(c) Where a district boundary line between any two height districts is shown approximately 100 feet from the side of a street or streets and parallel thereto, such boundary line separating the two districts shall be deemed to be 100 feet distant measured at right angles from such side of such street or streets and parallel thereto.

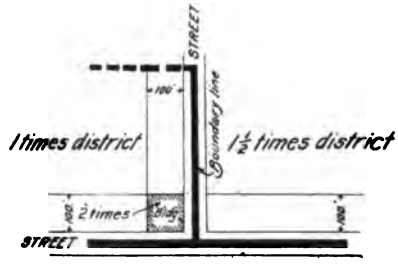


Height, rule "c"

(d) Where a district boundary line between any two height districts is shown along a railroad such boundary line shall be deemed to be the center line of the right of way of such railroad.

(e) Any island not otherwise designated within the limits of the City of New York shall be deemed to be in a 1½ times height district.

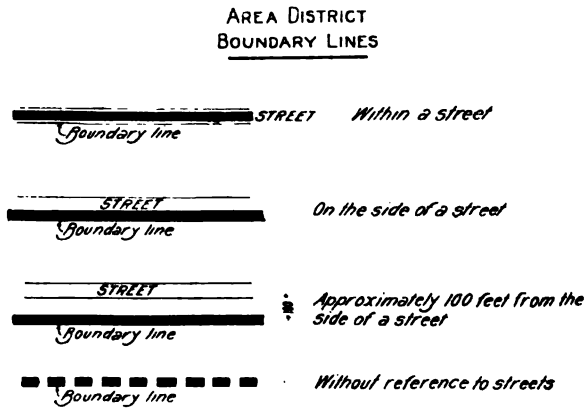
(f) Where under the preceding rules a height district of one class would overlap a height district of another class, the area that would be common to both districts under the above rules shall be included in the district permitting the greater height.



2 times district

Height, rule "f"

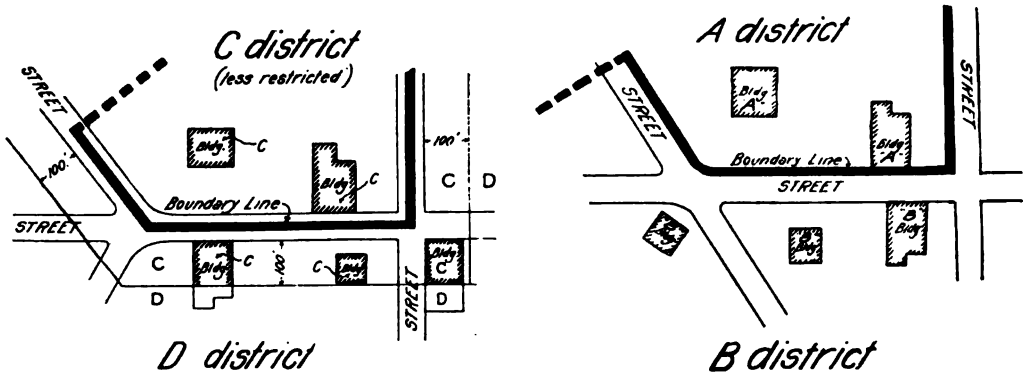
Area District Map Designations



Area District Map Designation Rules

(a) An area surrounded by a district boundary line shall be in the area district designated therein, except as otherwise provided by these rules.

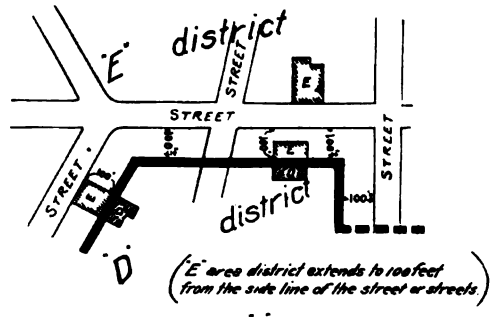
(b) Where a district boundary line between any two area districts is shown within a street or streets, the district having the less restrictive regulations shall extend across such street or streets so as to include the area between the further side of such street or streets and lines parallel thereto and 100 feet distant therefrom measured at right angles thereto. But such extended area of such district shall be limited where such boundary line passes from within a street to outside a street by the center line of the cross street when such change takes place in a cross street, otherwise by a line at right angles to the side of such street with boundary line therein at point of change.



Area, rule "b" Area, rule "c"

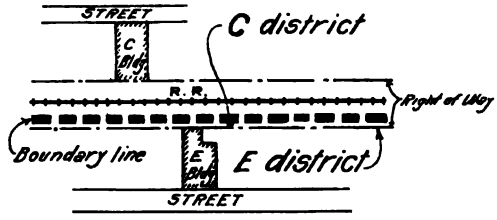
(c) Where a district boundary line between any two area districts is shown on the side of a street, such side of such street shall be deemed the boundary line separating the two districts.

(d) Where a district boundary line between any two area districts is shown approximately 100 feet from the side of a street or streets and parallel thereto, such boundary line separating the two districts shall be deemed to be 100 feet distant measured at right angles from such side of such street or streets and parallel thereto.



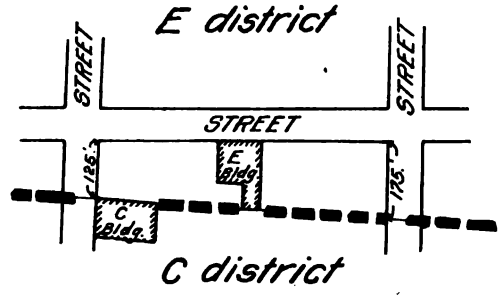
Area, rule "d"

(e) Where a district boundary line between any two area districts is shown along the side of a railroad, such side of the right of way of such railroad shall be deemed to be the boundary line separating the two districts.



Area, rule "e"

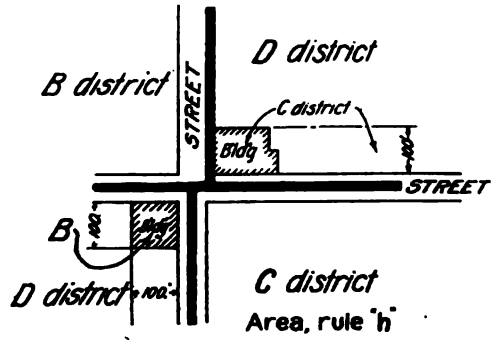
(f) Where a district boundary line between any two area districts is shown and dimensions given locating it from recognized lines or points, the area designations on either side shall govern up to the district boundary as thus located.



Area, rule "f"

(g) Any island and any area on which buildings may be constructed in navigable waters outside shore or bulkhead lines within the limits of the City of New York which is not otherwise designated shall be deemed to be an A district. Any other undesignated area shall be deemed to be in the district nearest thereto.

(h) Where under the preceding rules an area district of one class would overlap an area district of another class, the area that would be common to both districts under the above rules shall be included in the district having the less restrictive regulations.



APPENDIX IX.—DISTRICTING RESOLUTION ANNOTATIONS

These notes and accompanying diagrams were prepared to explain or illustrate more fully the rules laid down in the resolution. They are not a part of the resolution. They indicate in certain cases the need of supplementary rules, which under the resolution may be adopted by the Board of Standards and Appeals.

Sec. 1, Par. (b). The street line, as here defined, is virtually the same as "building line" as used in the Building Code, except that here the street line is without exception the line dividing the public street or open space from private property. Even where there is a setback by law or by covenant in the deed, the street line remains as above defined.

Sec. 1, Par. (c). Throughout the resolution where the word "mean" is used, it is intended that it should be taken in the sense of the arithmetical mean or weighted average and not in the sense of half the sum of the extremes. The exact definition of "mean" and the method of its determination may appropriately be covered by a ruling of the Board of Standards and Appeals. In determining the width of the street for the purpose of regulating the height of a building, advantage may be taken of public parks and other open spaces, but this advantage is strictly limited by Section 9, paragraph (a), which applies to streets of more than 100 feet in width the same height regulations that are applied to streets 100 feet in width.

Sec. 1, Par. (d). This definition of curb level is very nearly the same as the one in the Building Code and the one in the Tenement House Law. It will be observed, however, that in the last clause of Section 1, paragraph (f), the definition of curb in the Tenement House Law will govern wherever the building comes under the Tenement House Law. If a corner building faces on a 60-foot street and two 100-foot streets, the height of the building may be determined from the higher of the two 100-foot streets. A street or public open space wider than 100 feet will be considered to be 100 feet in width. If a building not on a corner runs through a block from one street to another each street wall will take its height from the street on which it faces, but the yards and courts will all be reckoned from the curb level of the highest street whether on a corner or not.

Sec. 1, Par. (e). A street wall, as here defined, is not necessarily a wall on the street line. Here the street line is the dividing line between the public legal street and the private property regardless of whether there is a set-back easement or not. If a street wall or a portion of a street wall is set at an angle with the street line, it should be considered as set back at its average distance from the street line. Of course, this will not prevent the projection of ordinary dormers and bay windows beyond the street line as allowed in the Building Code, nor will it prevent the projection of wall signs, etc., provided that they keep within the height regulations. The street wall is also intended to include the front walls of set backs as they may occur above the height limit at the street line and will also include the front walls of dormers, towers and headhouses. The street wall will also include any other wall which is near enough to any street to be affected by the height limits upon such street.

Sec. 1, Par. (f). The height of a building is virtually the same as defined in the Building Code. A roof sign or other structure on the building would have to come within the height limit. Parapets, dormers, head-

houses, roof signs, etc., may be excepted from the above as set forth in the exceptions to the height provisions in Section 9.

HEIGHT OF A BUILDING

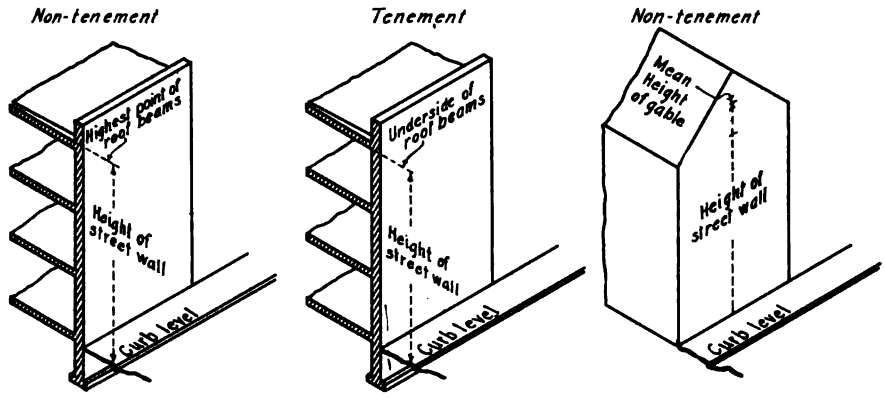


FIG. 136.

Sec. 1, Par. (g). The depth of a lot would be measured, where possible, parallel with the sides of the lot, but if they were not parallel it would be measured in the direction of the bisectrix of the angle between them. Where there would be more than one bisectrix the resultant bisectrix would be used.

Sec. 1, Par. (h). This differs from the definition in the Tenement House Law. There the rear yard is between the extreme rear line of the building and the rear of the lot. Here it would be between any rear line of the building and the corresponding rear line of the lot behind it. However, it has been the custom of the Tenement House Commissioner to interpret that law in the manner here suggested.

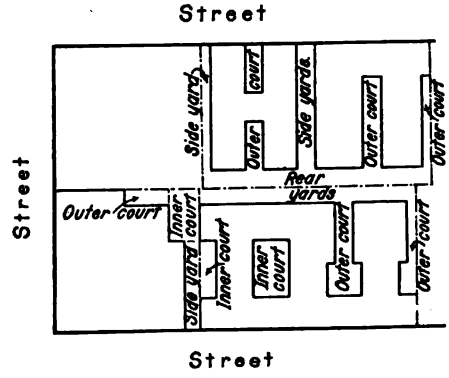


FIG. 137.

Sec. 1, Par. (i). This definition of the depth of a rear yard applies only to determining the depth of a rear yard as a percentage of the depth of the lot. It does not relate to the "least dimension" of a yard required at any given height.

Sec. 1, Par. (k). The definitions of courts are approximately the same as those of the Tenement House Law. In the case of a building that is not required to have a rear yard, a rear open space equal in size to an inner court is required where an outer court or a side yard opens on it.

Sec. 1, Par. (l). The height of yards and courts will as a general rule be measured as they are in the Light and Ventilation Article of the Building Code, that is, from the lowest level of the yard or court. In a business district the lowest level might be the top of the ground story or it might be 23 feet above the curb. To allow for stairway and elevator pent houses, the highest level of a court or yard wall can be the mean of all of the highest levels of such wall. As an exception to the above rule for all buildings that are subject to the provisions of the Tenement House Law, the height of yards and courts will be measured from the curb level even though the yard or court actually starts at or above the second floor level.

Sec. 1, Par. (m). If a court or yard is of irregular shape, say, for example, a trapezoid, the mean clear horizontal dimensions in each direction will be calculated and the least of these would be the one taken for the

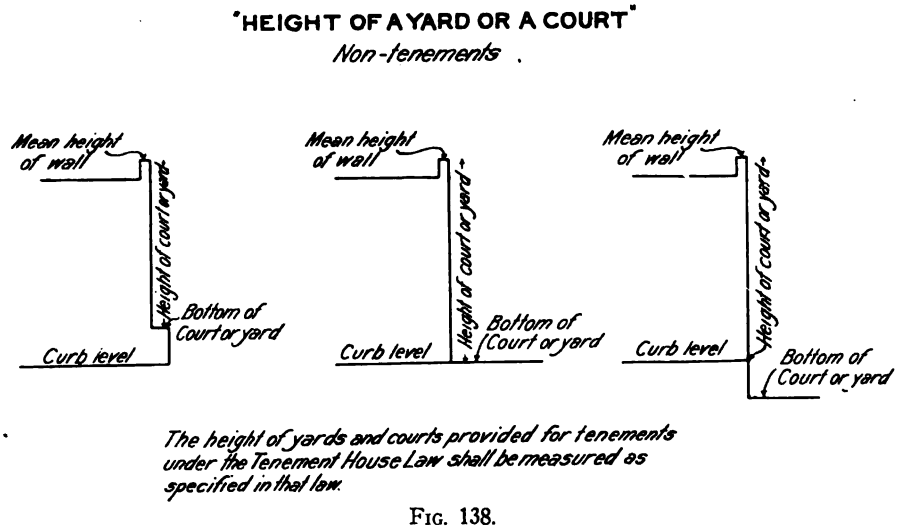


FIG. 138.

purposes of this resolution. The exact method of computing such dimensions will presumably be covered by a rule of the Board of Standards and Appeals.

Sec. 1, Par. (n). The length of an outer court should always be measured from the closed end. This is done with a view to encouraging the widening of courts near the open ends.

Sec. 8, Par. (b). Exactly the same principles apply in all five districts. The accompanying diagram shows the five curves of limiting heights. In a one and one-half times district the height of all buildings will be made to conform approximately to that now provided for in the Tenement House Law. However, on account of the difference in definition of curb level, buildings other than tenement houses will take their height from the widest street and not from the street of greatest grade. A setback means briefly this: that if an owner wishes to carry a building to a greater height than that allowed on the street line, as, for example, above 90 feet on a 60-foot

Chart showing Height Limits at the street line for all street widths in all Height Districts.

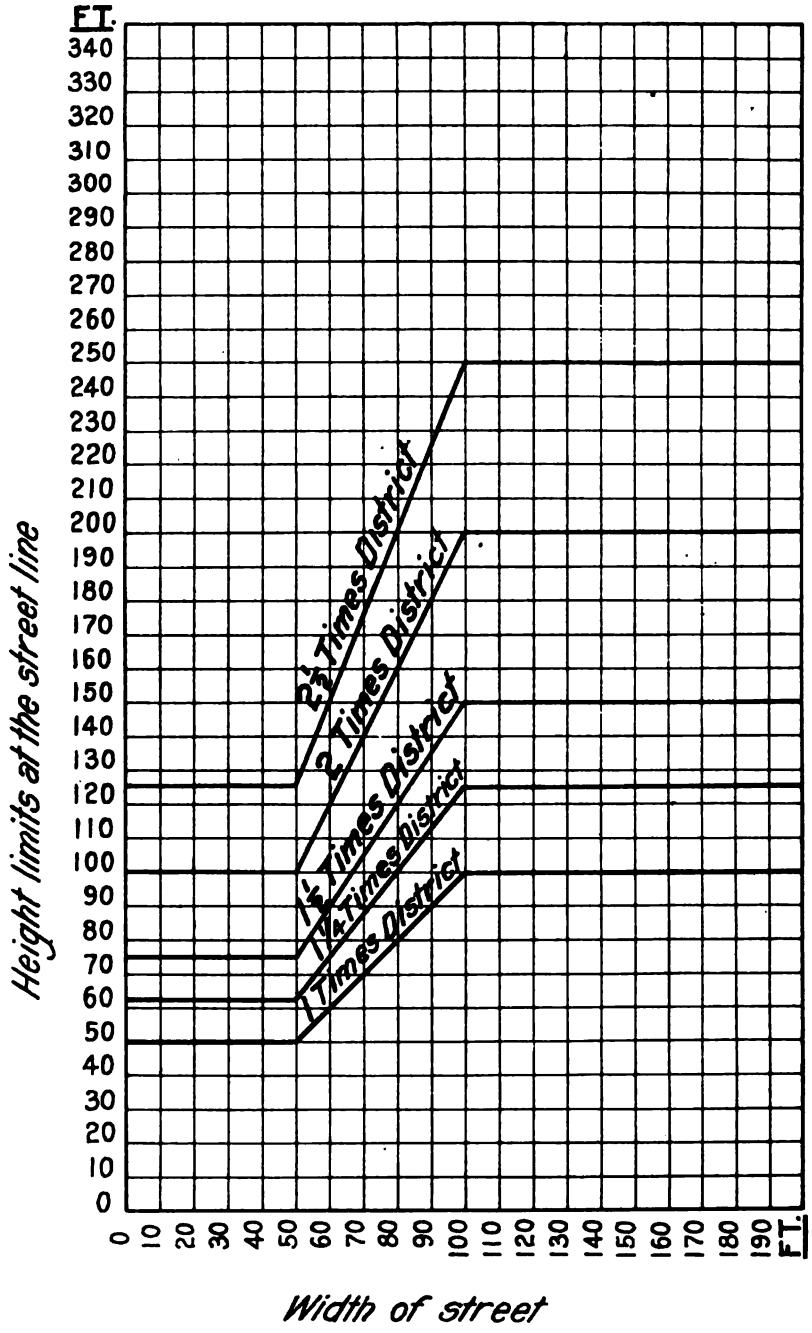


FIG. 139.

street in a one and one-half times district, he can add on an upper 30 feet provided he sets the upper 30 feet back 10 feet from the street line. He can make that setback right from the height limit in the form of a mansard which would slope back in a ratio of one foot horizontally to three feet vertically, or in a setback of three and one-third feet for each of three stories, or in a setback of 10 feet for the whole height of 30 feet; then he can set back again above the top of this set-back provided he keeps in the same set-back plane. In general the set-backs might be determined by a line drawn from the centre of the street up through the horizontal line in the street wall on the street line at the level of the height limit on the street

SETBACK PRINCIPLE.

Typical example in a 1½ times district, for streets 50' to 100' wide.

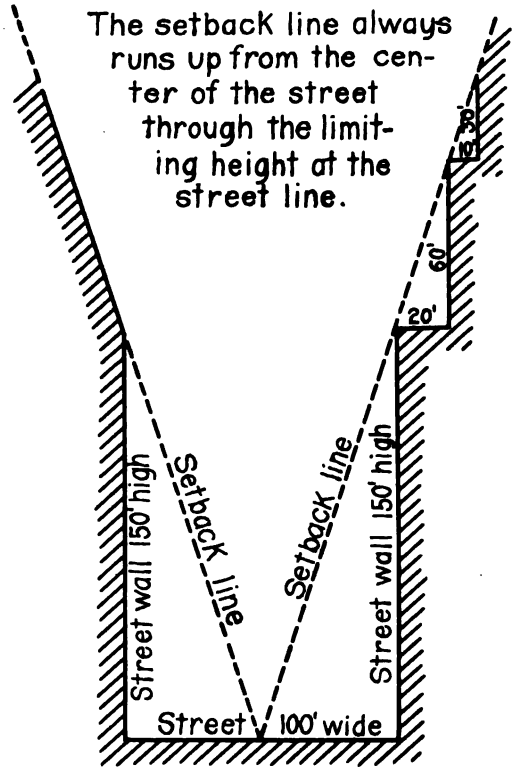


FIG. 140.

line for that district and street. In the street in question this horizontal height limit line would be at a level of 90 feet. These two lines would determine a plane which might be called a setback plane, and no portion

of the building erected above the height limit would project in front of this set-back plane except as allowed in the case of dormers, towers and parapets.

Sec. 9, Par. (a). It is intended that a building should be permitted to go just as high under this resolution on a 30 or 35-foot street as it could

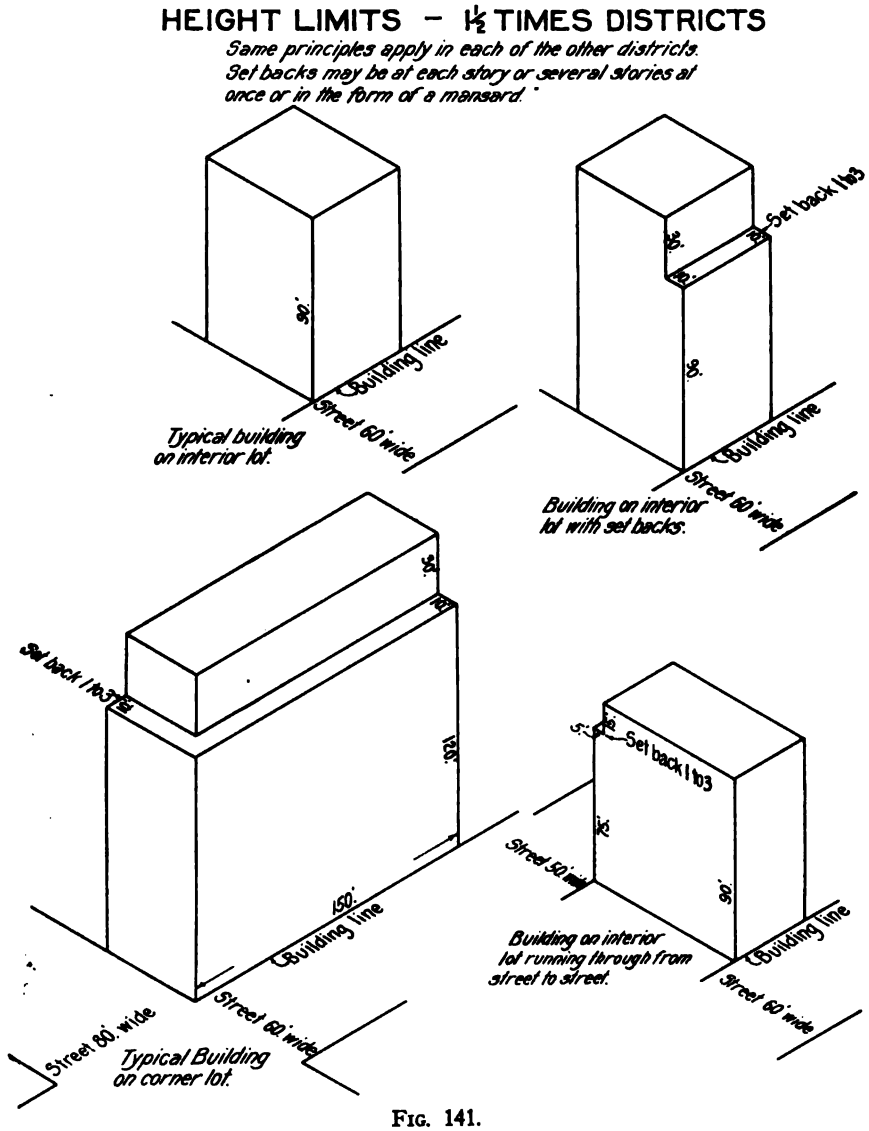


FIG. 141.

on a 50-foot street, and, conversely, a building facing on a street or park or open space more than 100 feet wide, including the bordering street can go no higher than it could if it faced on a 100-foot street.

Sec. 9, Par. (b). Any building or any part of a building within 100 feet of a corner regardless of whether its front actually turns the corner or

not, and regardless of whether the lot runs through to the wider street or not, may take advantage of the height allowed on the widest of the intersecting streets. A single building on a corner may carry its height on the wider street back for 150 feet along the narrower street.

CORNER BUILDINGS

One and One-half Times District

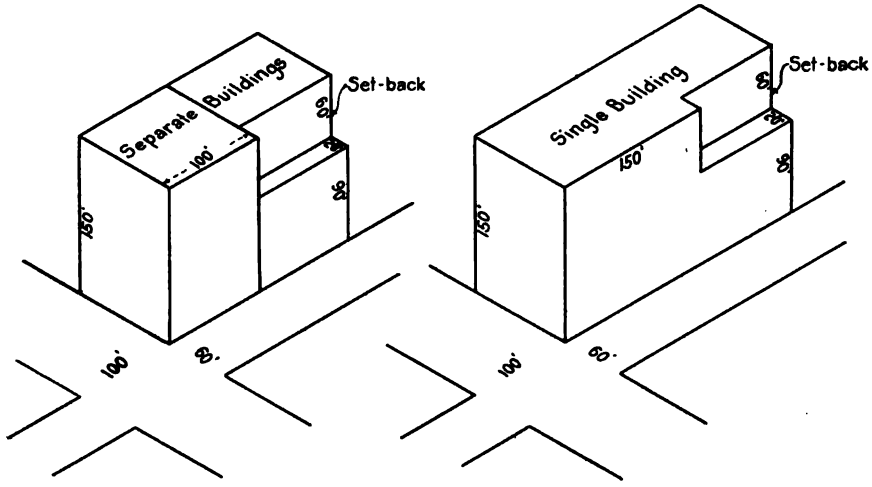
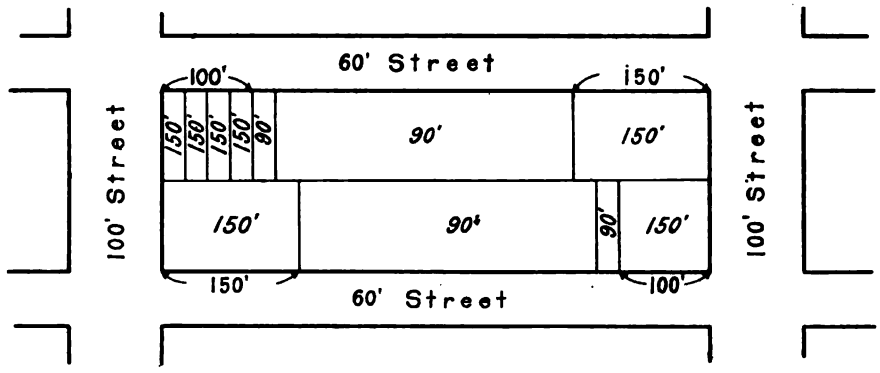


FIG. 142.



Typical example showing influence of wider street at intersections. Figures in buildings, as "150," show height limit at the street line, in a 1½ Times Height District.

FIG. 143.

Sec. 9, Par. (c). This provision is intended to allow for dormers in a mansard roof above the height limit on the street line. It will permit one large dormer on each mansard or a number of small dormers on each mansard, provided their aggregate frontage does not exceed the provisions

here stated. It will also permit elevator headhouses on or near the street line and permit a tower or belfry or other such feature to be carried up on the street line, a feature which would hardly be possible under Section 9, paragraph (d), except on a street over 100 feet wide. On a 100-foot frontage this dormer provision will mean that the dormer on the street line at the height limit can be 60 feet wide; by the time it has gone up 10 feet it can be only 50 feet wide; by the time it has gone up 30 feet it can be only 30 feet wide, and by the time it has gone up 60 feet it will be reduced to a point. This rule will create at least three limiting planes which intersect the setback plane, as shown on the accompanying diagram.

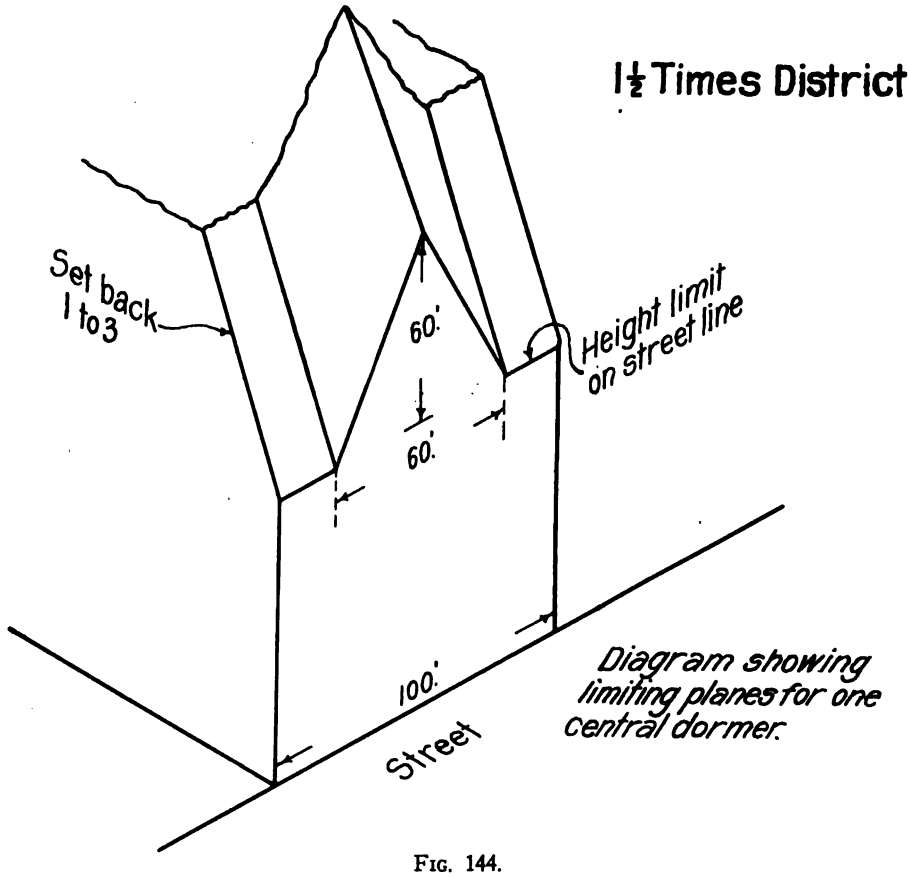


FIG. 144.

Sec. 9, Par. (d). If a street, park or open space is 150 feet or more in clear width in front of a building, a tower may be built directly across the whole front of the building provided the tower does not cover more than 25 per cent of the area of the lot. On a street 100 feet wide a tower can be built across the whole front of the building provided that it sets back 25 feet from the street line and also that it does not occupy more than 25 per cent of the area of the lot. If the building has 200 feet frontage on a 100-foot street, a tower with a 50-foot frontage may be built on the street line to any height and then splay back on either side in a ratio of

one foot in increased width parallel with the street line for every four inches back from the street line, but in no case can a tower occupy more

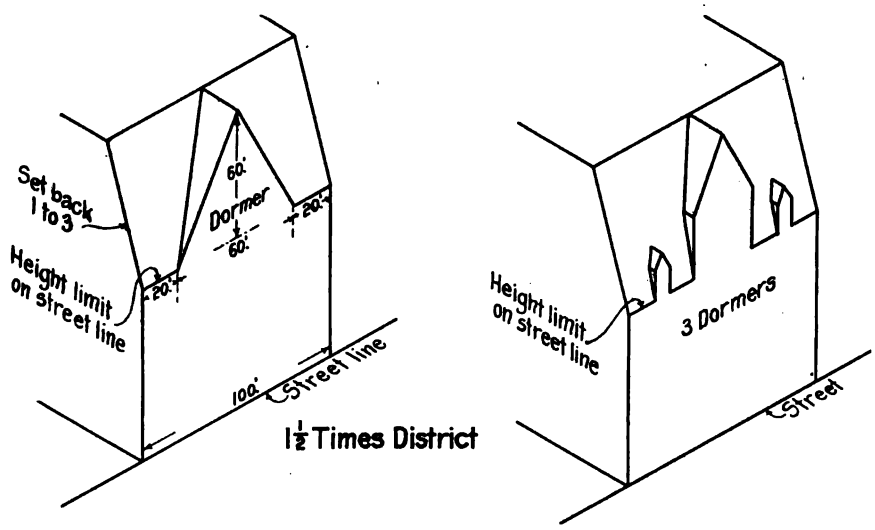


FIG. 145.

than 25 per cent of the area of the lot. A tower on the corner of a park and a 60-foot street can rise directly on the street wall on the park side, but will have to set back 45 feet from the 60-foot street line. If, however, its frontage on a 60-foot street were only a quarter of such street frontage, the tower might approach within 20 feet of the street line. The increasing sizes of yards and courts would be constantly operative and it would be desirable so to place the tower that the yard and court provisions would not interfere with it. (See Fig. 146.)

Sec. 9, Par. (e). Let us suppose it were proposed to erect a building on an inside lot on a 50-foot street in a two and one-half times district and a large building across the street was 525 feet high, an existing building on one side 225 feet high and one on the other side 150 feet high. The height limit on the street would be 125 feet normally. All three of these surrounding buildings are well over that limit; one of them by 400 feet; one by 100 feet and one by 25 feet, or a total of 525 feet. Dividing by three would give an excess average height of 175 feet, therefore, according to this provision, the proposed building might rise to a height of 125 plus 175 feet, or 300 feet. If at some future time the 225-foot building on one side were to be torn down and a new building erected on this site, the new building could use the 300 feet of the first new building in computing the excess height to which it might rise. Existing buildings lower than the height limit or vacant lots would be considered in this computation as though they were at the height limit. If within 50 feet on either side and directly across the street there were, for example, five buildings, only two of which were higher than the height limit, the excess height of these two buildings would be divided by five in determining the excess height to which the proposed buildings might go. Buildings directly across either street from corner buildings should be considered, but a building diagonally across the corner could not be considered. The proposed building should not be counted in arriving at the above divisor. (See Figs. 147 and 148.)

Sec. 9, Par. (f). If a street is 100 feet wide a cornice may project five feet. If the street were 50 feet wide it might project two and one-half

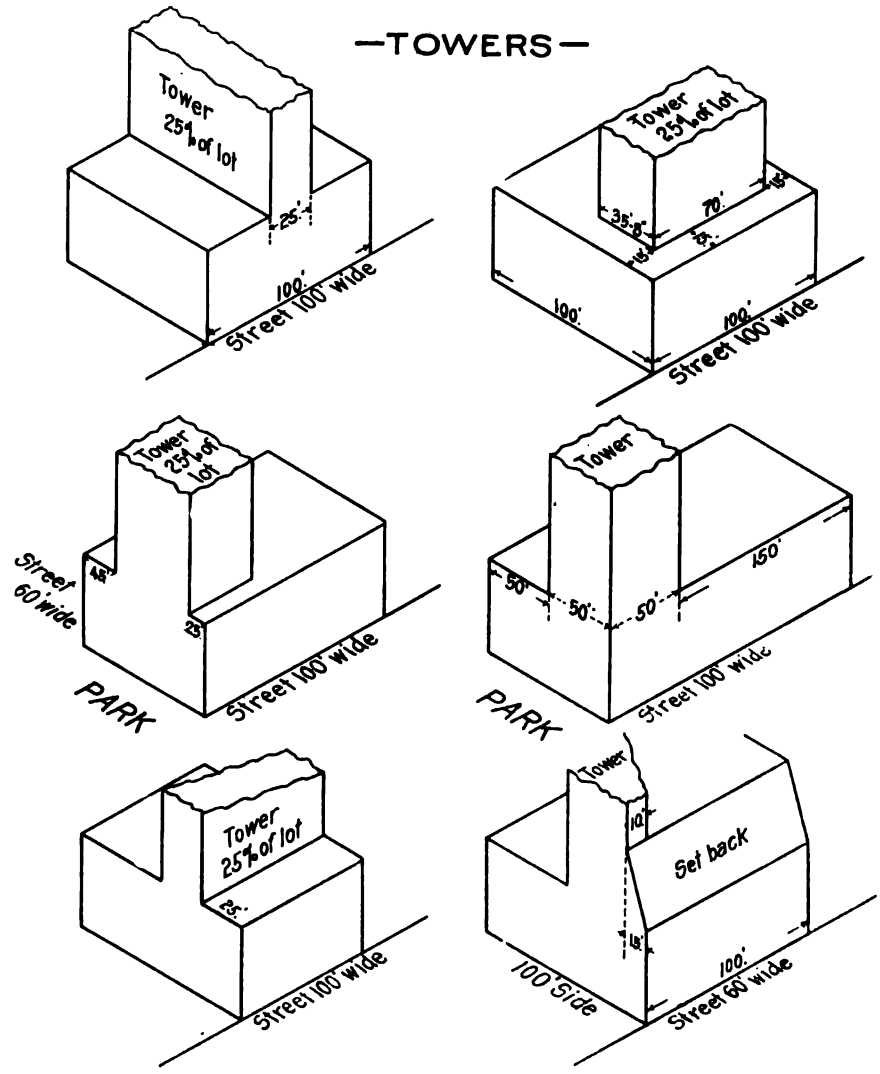


FIG. 146.

feet. The projection allowed on the wider street can not be carried back on to the narrower street. It is obvious that a parapet on a setback portion could be higher than on the street wall. A cornice could project its full five per cent in front of the parapet wall even above the height limit, but not above the height limit for the parapet. If on a 100-foot street a building or the upper stories of the building set back 20 feet from the street line, a cornice might project six feet in front of such set-back wall at the height limit, if it were not for the provision that no cornice shall project more than five feet beyond the street wall. If it should be desired to have

a projection of 10 feet to a cornice on a 100-foot street the whole wall should set back five feet from the street or set-back plane.

Sec. 11. This agrees with the Light and Ventilation chapter of the Building Code, which provides that a court for the lighting and ventilation

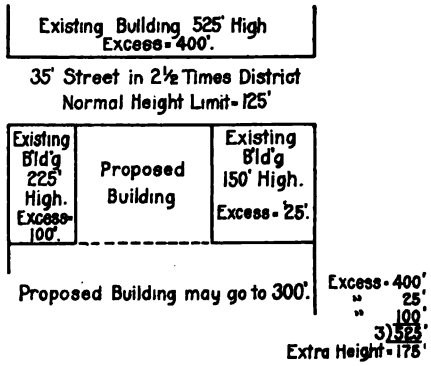


FIG. 147.

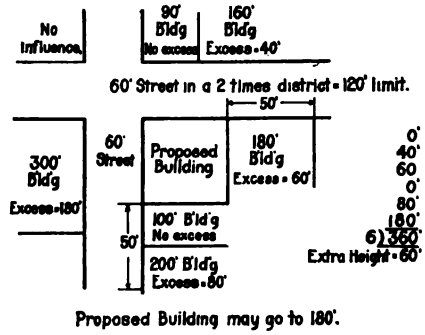


FIG. 148.

of any room shall have a width at any point of not less than one inch for every foot of height. Of course any tenement house in an A district would

CORNICES AND PARAPETS
in a 2 times district.

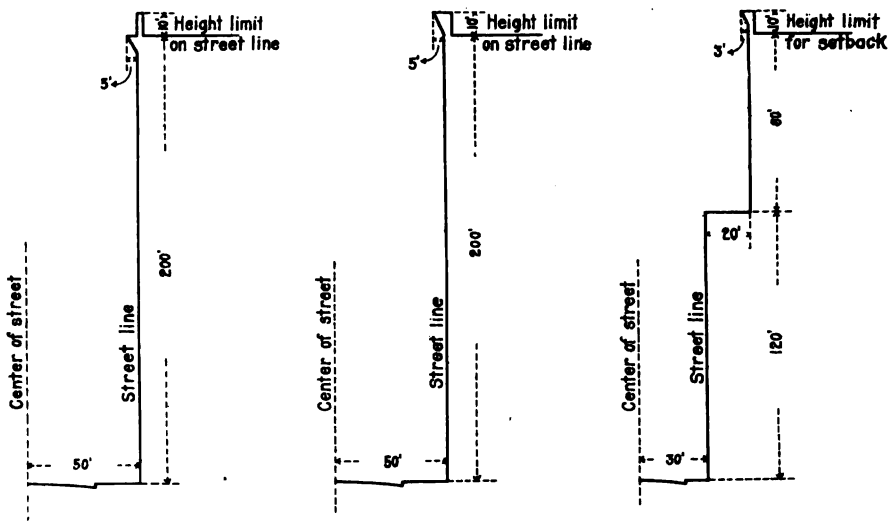


FIG. 149.

have to conform to the Tenement House Law as to required yards and courts.

Sec. 12. Where a building is back to back with another building a required rear yard at 150 feet in height will be 25 feet in least dimension; at 90 feet in height it will be 15 feet in least dimension, all heights being

taken from the curb level where they relate to buildings in a residence district. If the building is not in a residence district, 3 feet 10 inches may be

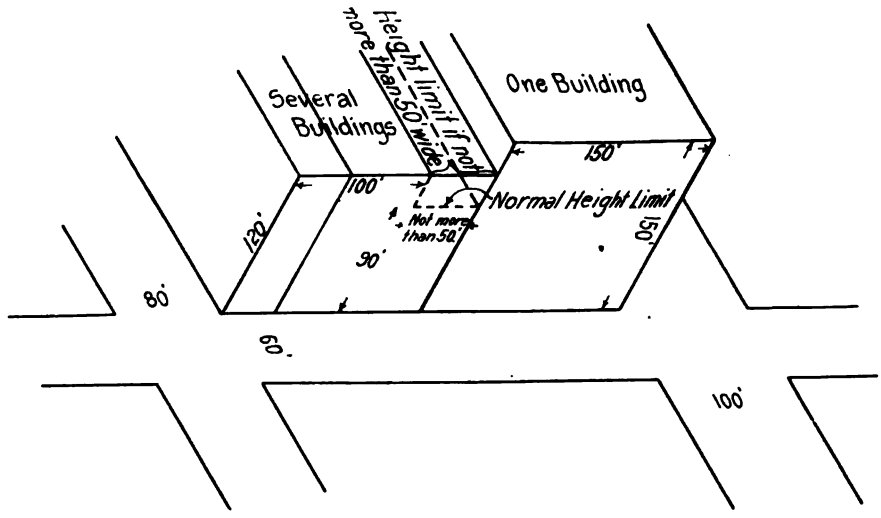


FIG. 150.

subtracted from each of these least dimensions as the yard may start 23 feet above the curb.

An outer court at 150 feet in height at the top will be 12½ feet in least dimension, but if its length is more than eight times its width, it will have to be widened out somewhat at the open end. At 90 feet in height, such outer court will have to be 7½ feet in width. If in a building 150 feet high, where an outer court would normally have to be 12½ feet wide, the court, instead of being eight times, is not over four times as long as it would have to be wide—that is, not over 50 feet long—then it could be 6 inches narrower for every 24 feet of height or 3 feet narrower for a building between 144 and 168 feet high. This would bring down such width to what is required under the Tenement House Law. By the same rule the side yard required under the Tenement House Law may be reduced from 12½ feet to the 10 feet required in that law provided such yard is not more than 50 feet in depth from the street. (See Figure 151.)

Inner courts, whether on the lot line or not, will be about half way between the required yard and the outer court in dimensions. For example, in a building 150 feet high, an inner court at the top could be 25 feet square or a little less than 18 by 36 feet; at 90 feet in height at the top it would have to be 15 feet square or contain 225 square feet, provided that it were not more than twice as long as it were wide for that area. In the case of a building which was not back to back with another building, an outer court could use the minimum provisions here stated for outer courts only in case the rear yard on which it opened was of the dimensions here given for an inner court; that is to say, at 150 feet in height, 25 square feet or 18 by 36 feet, or with dimensions somewhere between, giving an area of 625 feet (see Figure 152). However, a special exception is made to the above especially for corner buildings on narrow lots according to which the size of such an inner court may be reduced if connected with the street by a side yard.

Sec. 13, Par. (a). In a building five stories, or approximately 56 feet in height, a rear yard under these provisions will have to be 14 feet wide

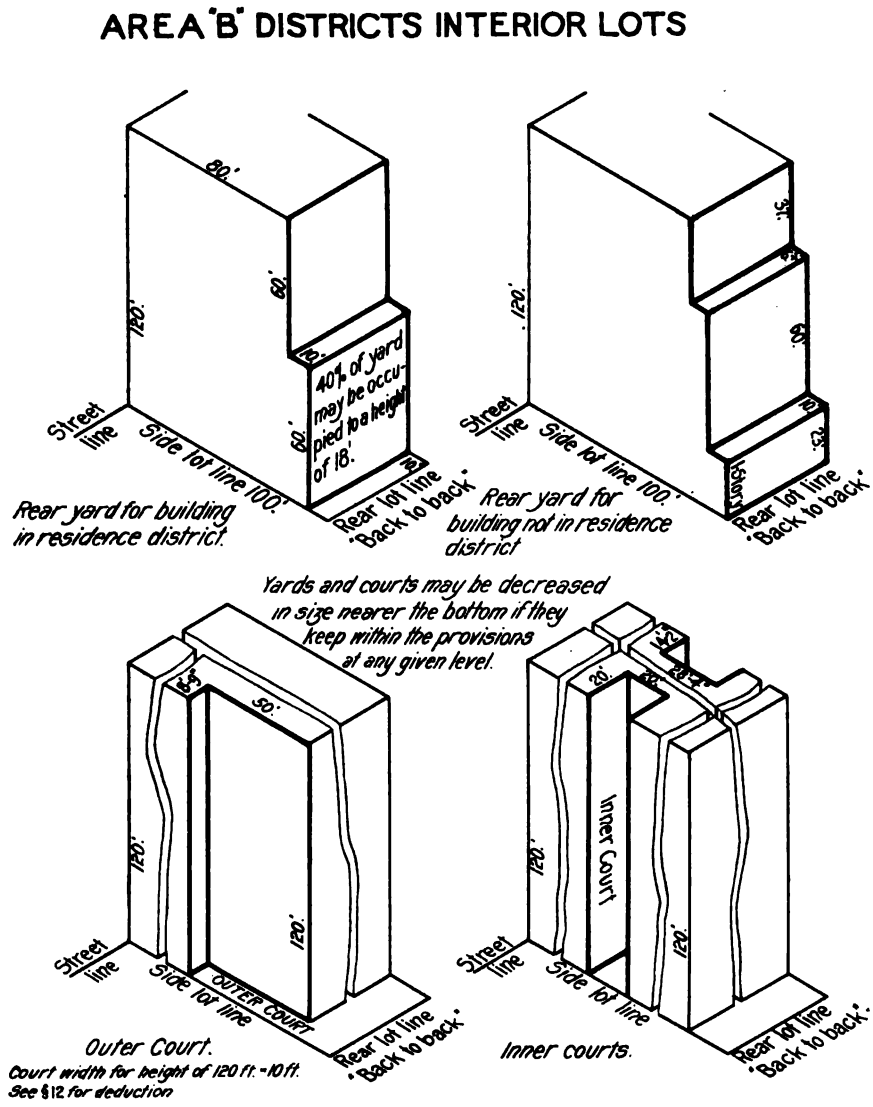


FIG. 151.

at the top or 2 feet wider than required under the Tenement House Law. An outer court will have to be 7 feet or 1 foot wider than required under the Tenement House Law. An inner court will have to be 14 feet square or a little less than 10 by 20 feet, while under the Tenement House Law an inner court on the lot line would have to be 12 by 24 feet. However, the 70 per cent area clause in the Tenement House Law is very apt to require increases from the minimum widths and depths of courts and yards

greater than the difference between this resolution and the Tenement House Law. An outer court 7 feet wide can be 56 feet long before it will have to be widened out at its extreme end.

A special exception for outer and inner court provisions was made in lots 30 feet or less in width on account of the extra difficulties of planning

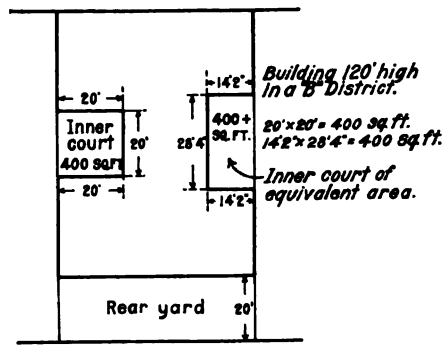


FIG. 152.

practicable buildings for such lots. On a lot 30 feet or less in width an outer court in a building five stories or 56 feet need not be more than 4 feet 8 inches wide under this resolution, although under the Tenement House Law it would have to be at least 5 feet wide. For a width of 5 feet it could be 40 feet long, but if it were desired to make the outer court 60 feet long, the 20 feet of length nearest the open end would have to gradually widen out to 7½ feet. The side yard of such building need not be over 4 feet 8 inches wide through from street to prescribed rear yard. An inner court in such a building under this resolution might be about 6½ by 13 feet, although under the Tenement House Law it would have to be at least 8 by 14 feet, if on the lot line. These narrow lots are virtually put in the B districts except for rear yards. (See Figure 153.)

Sec. 13, Par. (b). The recreational problem is so important in residential districts that a concession in the yard and court provisions is made in order to obtain additional space for playground use. An individual developer or a group of property owners may, by giving up 10 per cent additional of their space, be relieved from the yard and court requirements of the district in which they are located and follow the yard and court requirements of the next less restricted district instead. The 10 per cent given up for recreational use might be provided in the center of the block in addition to the required yard space or it might be in any lot or lots running through to any bounding street, or it might be on an adjoining lot. Of course, this 10 per cent would have to be in addition to any yard and court provisions required in this resolution and also in addition to the requirements of the Tenement House Law if they were greater than those in this resolution.

Sec. 14, Pars. (a) and (b). On a residence street, a tenement or apartment house on an interior lot in a D district covering 60 per cent of its lot and four stories or 44 feet in height on a lot 100 feet deep would have a rear yard 20 feet deep; an outer court would have to be at least 7 feet 4 inches wide and not over 44 feet long for such width. If the outer court were longer the open end would have to be wider; an inner

court of such a building could be 14 feet 8 inches square or about 10½ by 21 feet. Where a required depth of a rear yard at the curb level would

AREA "C" DISTRICTS INTERIOR LOTS

Least horizontal dimensions of yards and courts where required are shown below
On lots 30 feet or less in width the court provisions for B districts may be followed:

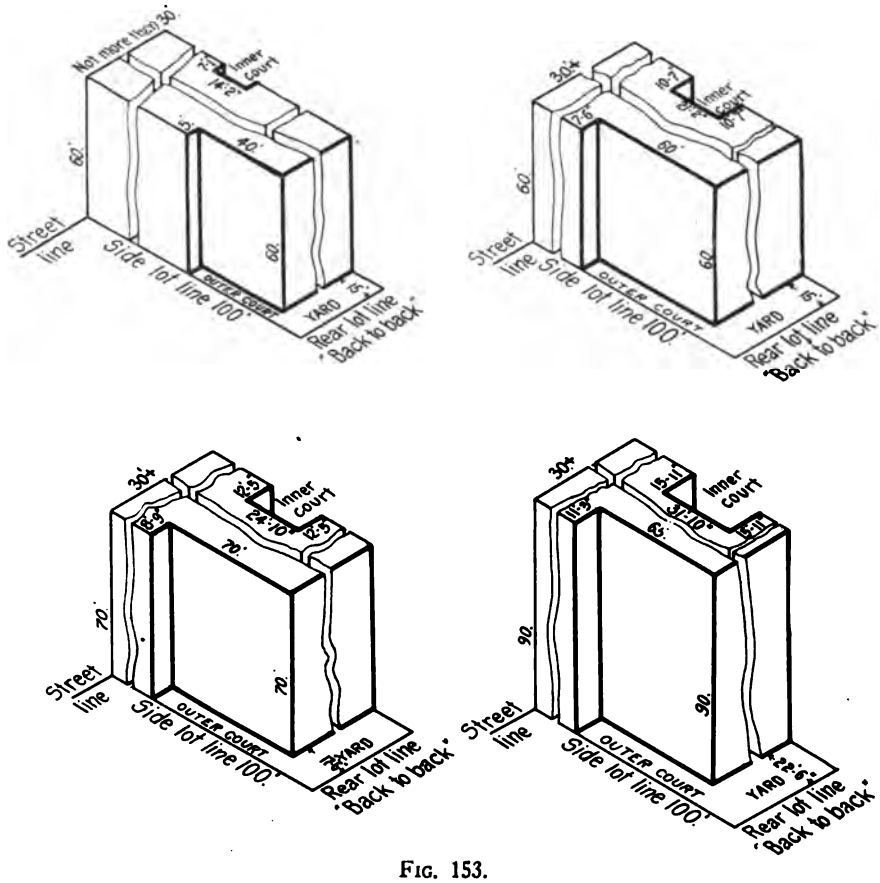


FIG. 153.

be over 10 feet and the building sets back from the street line across the whole front of the lot at the curb level, the rear yard may be decreased in depth by one foot for every foot of setback in front but the rear yard must not be reduced to less than 10 feet.

In the case of a building on a plot 30 feet or less in width, the sizes of outer courts and side yards and inner courts would be the same as required for buildings on plots over 30 feet wide in the C districts. In the case of a one or two family house, three stories or approximately 34 feet

in height, the rear yard would be 20 feet deep if on a residence street; an outer court would be 4 feet 3 inches wide and a little less than 34 feet long without being wider at its open end. An inner court would be 8 feet 6 inches square or about 6 by 12 feet.

Sec. 14, Par. (c). No building within a residence district and within a D district can occupy more than 60 per cent of any interior lot. In a

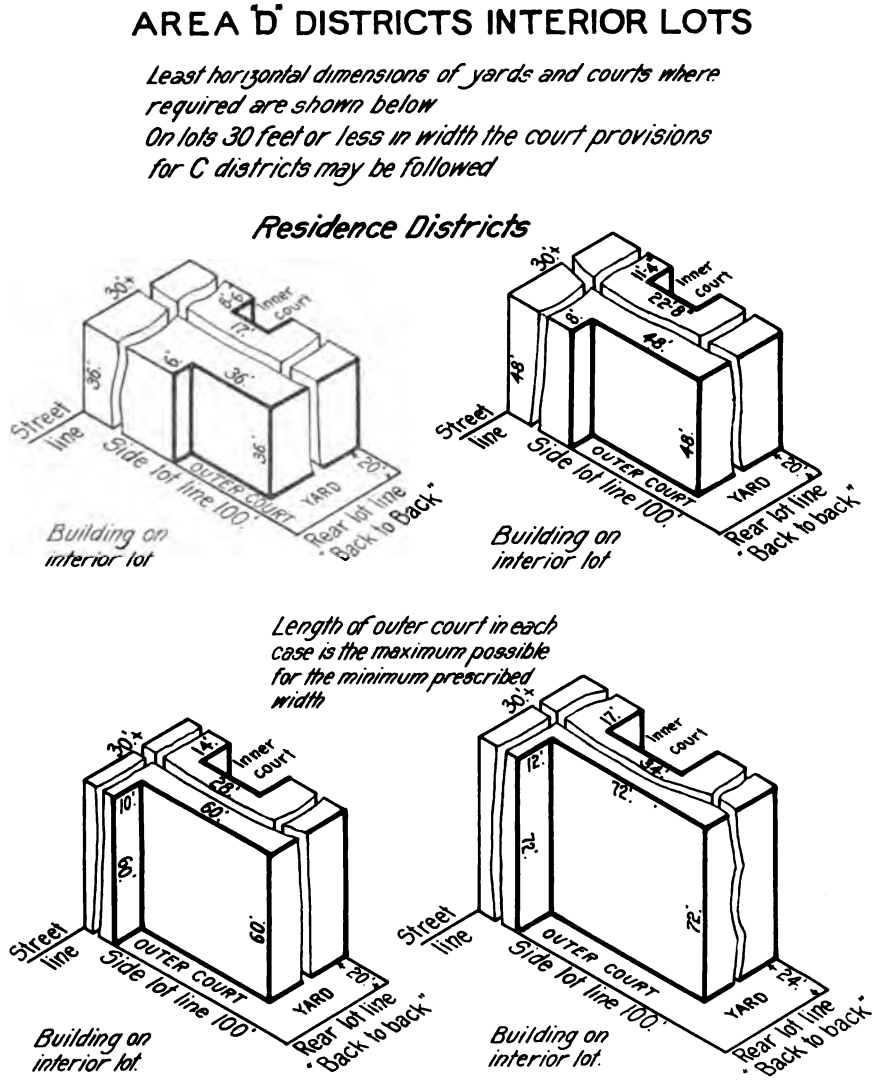


FIG. 154.

D district on a corner lot 100 by 100 feet a building could occupy 80 per cent of the 8,000 feet on the corner, and 60 per cent of the remaining 2,000 square feet or an average of 76 per cent of the whole plot. If the actual lot on the corner contains less than 8,000 square feet the adjoining

lots if not corner lots themselves would be considered as strictly interior lots in computing area to be covered.

Sec. 15, Pars. (a) and (b). In a residence district a rear yard for lots 100 feet deep would be 25 feet deep at the ground story, except that garages and other out buildings might occupy 40 per cent of such rear yard area. In an ordinary 2½-story house, approximately 25 feet high, an outer court or side yard would be at least 5 feet 2½ inches wide. Such a side yard would be required only on one side of a house. However, if a lot is 50 feet or less in width, a side yard of this sort for a 2½-story house could be reduced to 4 feet 2 inches. The 50 per cent allowance on the ground story would allow for one-story wings, bay windows, porches, etc. In the case of a building not within a residence district on a 100-foot deep lot the rear yard would have to be only 15 feet deep and no limitation is placed on the percentage of the lot which the building may cover. It would be possible

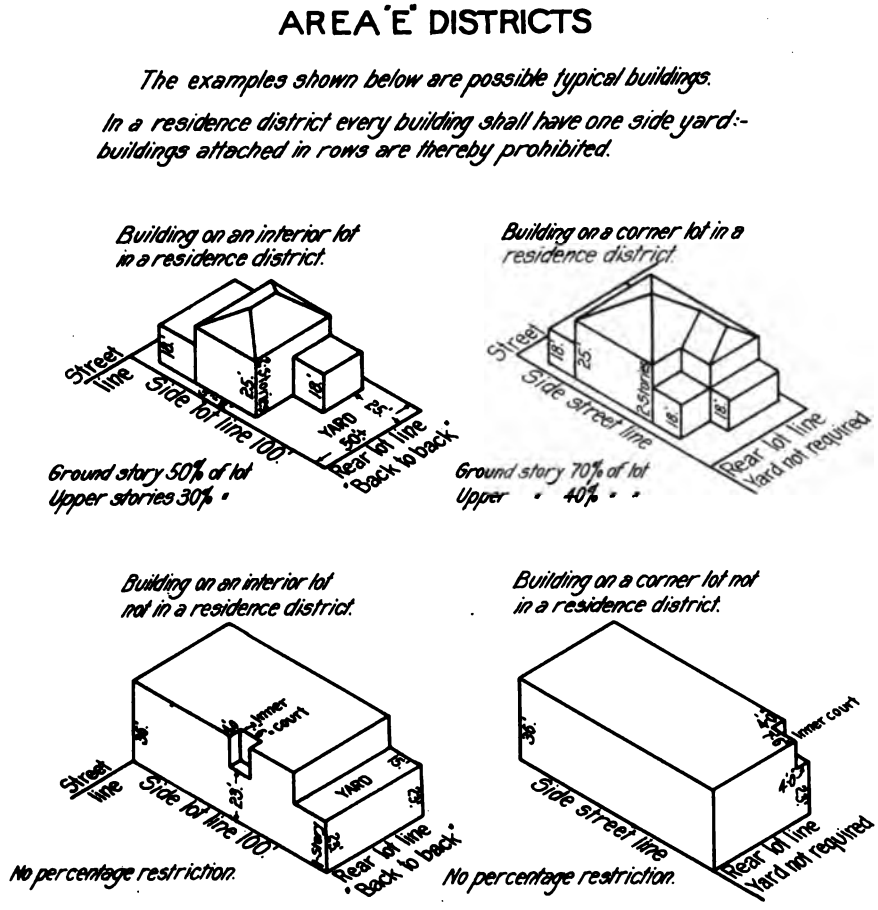


FIG. 155.

to build an apartment house in an E district provided it conformed with these percentage and yard and court requirements. Where a required depth of a rear yard at the curb level would be over 10 feet and the building

sets back from the street line across the whole front of the lot at the curb level, the rear yard might be decreased in depth by one foot for every foot of setback in front but the rear yard should not be reduced to less than 10 feet.

Sec. 15, Par. (c). In most cases an E district house would be on a lot not less than 40 by 100 feet. On such a lot 30 per cent of the lot area above the ground story would equal 1,200 square feet, giving a house 30 by 40 feet in size. On a lot 50 by 100 feet this would allow 1,500 square

REAR YARDS.

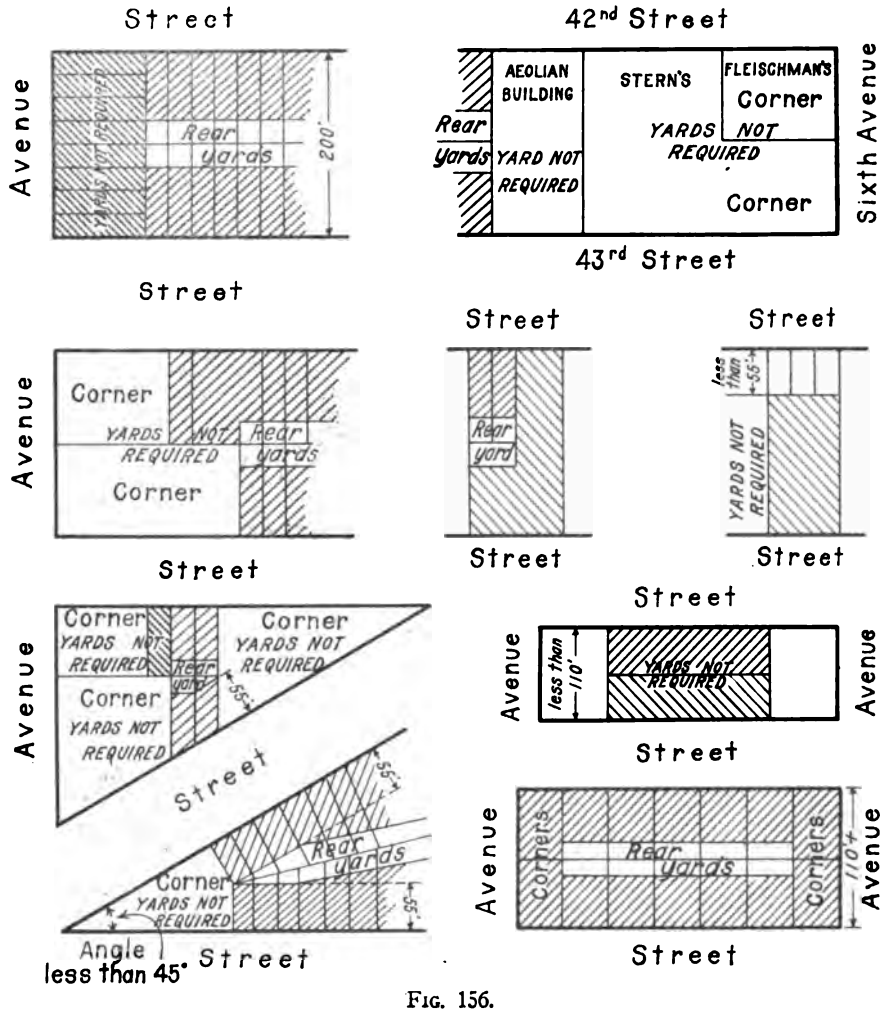


FIG. 156.

feet, giving a house 30 by 50 feet in size. The percentages specified in this section include all garages and other out buildings as well as porches, sheds, bay windows, balconies, etc. The occupancy of 40 per cent of the rear

yard is intended to allow flexibility in placing accessory buildings without increasing these percentages.

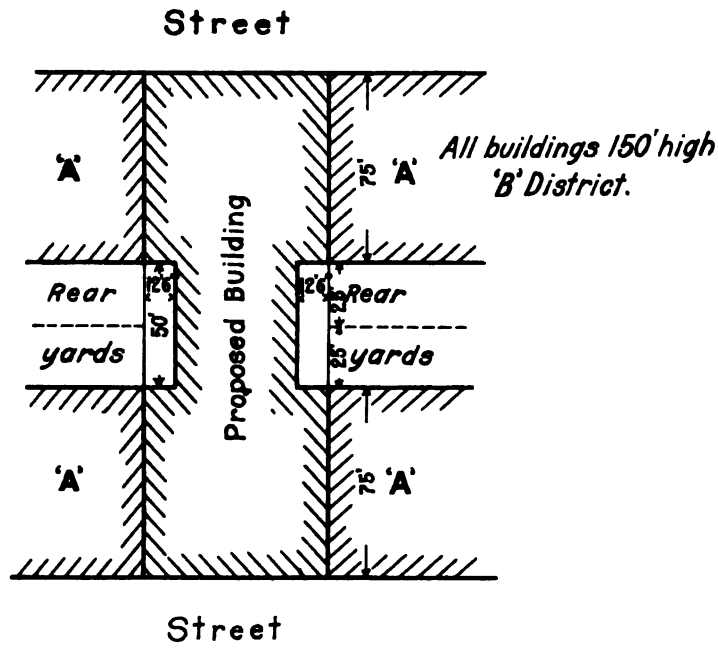
Sec. 16, Par. (a). In this rule it is assumed that within 55 feet of a street a building can usually be lighted directly from the street. If a block is 110 feet deep through from street to street it is hardly appropriate to demand rear yards but when blocks become deeper than that rear yards become more and more necessary (see Figure 156). On a lot 60 feet deep a rear yard would be 5 feet deep; on a lot 65 feet deep in a B or C district a rear yard would be 6 feet 6 inches deep; on a lot 80 feet deep under similar conditions a rear yard would be 8 feet deep and so on. If a block were 200 feet through from street to street and two lots were back to back with one another, one of them 50 feet deep and the other 150 feet deep, no rear yards would be required for either building except that the building on the lot 150 feet deep would have to conform to Paragraph (d) of this same section. No rear yard is required on a corner lot.

Sec. 16, Par. (b). The statement that the rear yard need not exceed 10 feet at the base means that the depth of 10 feet at the base required on a lot 100 feet in depth need not be exceeded in lots of greater depth. In any building which occurs in a residence district, even though it be a club or a school, a required rear yard would have to run down to the ground except that garages and other out buildings may occupy 40 per cent of the required rear yard space but they must not be over one story high. However, an exception would be allowed for the apse or choir of a church which would allow it to occupy 40 per cent of the rear yard up to a height of 30 feet above the curb level.

Sec. 16, Par. (d). Under the Tenement House Law a building over 70 feet deep which runs through the block or from street to street not on a corner has to be built around a rear yard and thus the building is divided into two entirely separate units. In many non-residential buildings this is impracticable and therefore it is provided that if a building runs through the block from street to street it must contribute to the light and air of the common rear yard spaces in the center of the block by giving up on each side an unoccupied space above the ground story equal at least to an inner court in area but differing from an inner court in that the least dimension need be no greater than that required for an outer court (see Figure 157). If, however, this court is necessary for light and air under Sec. 17, paragraph (a) it should be at least of the dimensions required for inner courts.

Sec. 16, Par. (e). In various instances, particularly in Manhattan, existing loft, warehouse and even office buildings, have been erected, sometimes to 12 stories or more in height, with rear yards considerably less in depth than would be required under this resolution. In fairness to a person who would erect a new building back to back with such buildings this section will permit him to make his rear yard about the same as the average of his back to back neighbor's yards. In determining such an average of back to back yards, a rear yard as large or greater than that required under this resolution, would be reckoned as though it were of the size here required. Above the top of an existing building its rear yard would be reckoned as though it were of the required size. A rule to compute the average width of existing yards could appropriately be adopted by the Board of Standards and Appeals. In a building 150 feet high in a B district the minimum size of such a rear yard must be in any case at least 12 feet 6 inches in least dimension at the top, which is the minimum width of an outer court at such level (see Figure 158).

LOTS RUNNING THROUGH FROM STREET TO STREET.



Buildings marked 'A' are interior buildings, each back to back with another building, and therefore require rear yards 25' wide. The inner courts in the building running through from street to street are each the area of an inner court (25' x 25' = 625 sq.ft.) and the width of an outer court (150 inches or 12'6")
Same courts are required for a similar building running through from one street to within 55 feet of another street.

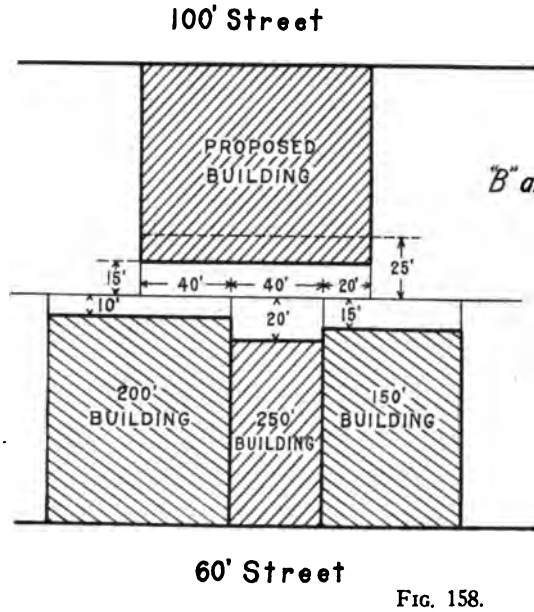
FIG. 157.

Sec. 17, Par. (a). A room which receives its necessary light and ventilation from the street and also from a court or yard would have to have one of its windows open on a court or yard of the size prescribed in this resolution. Any room which was lighted or ventilated entirely from yards and courts would have to open on at least one yard or court of the prescribed size.

Sec. 17, Par. (b). An outer court opening on a street might include part of the street within its required dimensions (see Figure 173).

Sec. 17, Par. (c). In general the area of inner courts should be equal to the square of the least dimension of a required rear yard at the same distance above its lowest level. It would be the square of the least dimension in inches per foot of height above the bottom of the court and not

INFLUENCE OF EXISTING YARDS.



"B" and 1½ Times District

40 × 10 = 400 SQ. FT.
40 × 20 = 800 SQ. FT.
20 × 15 = 300 SQ. FT.
100) 1500
15 FEET =

= Final depth of rear yard, although otherwise, for a 150' building, it would be 25' deep.

FIG. 158.

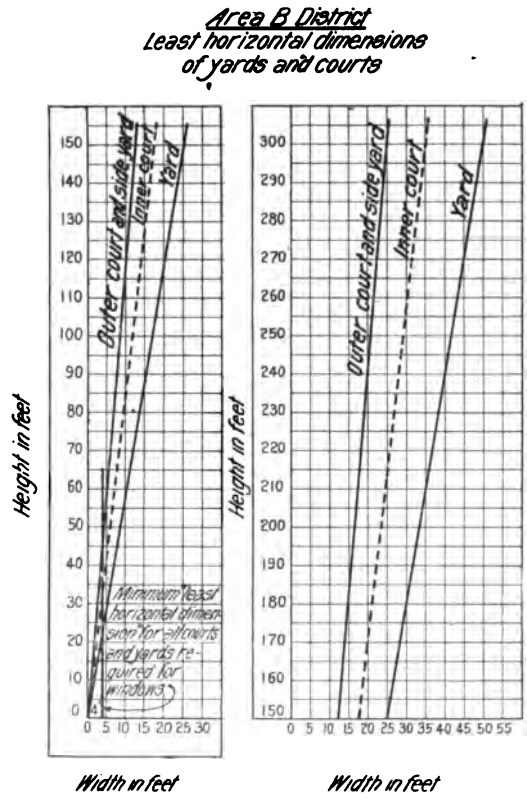


FIG. 159.

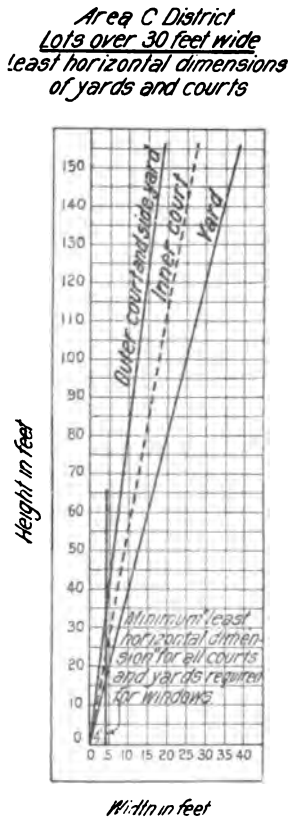


FIG. 160.

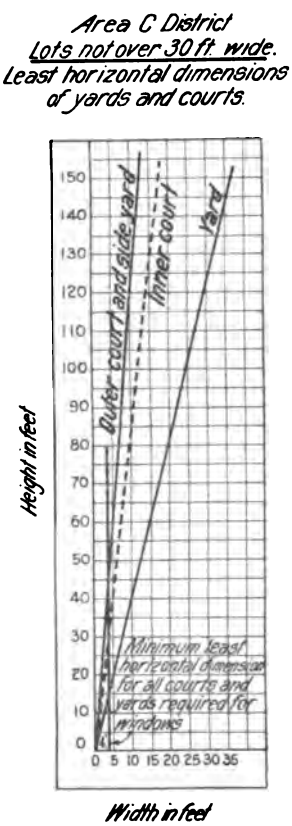


FIG. 161.

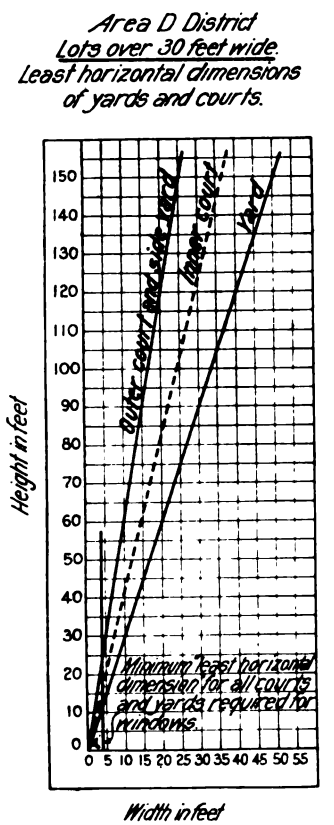


FIG. 162.

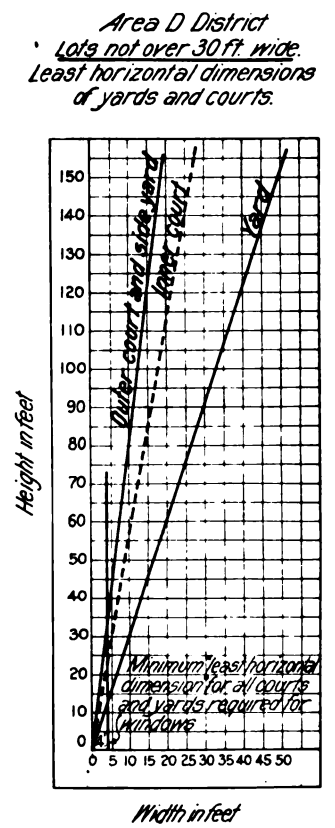


FIG. 163.

Area E District
Lots over 50 feet wide
Least horizontal dimensions
of yards and courts.

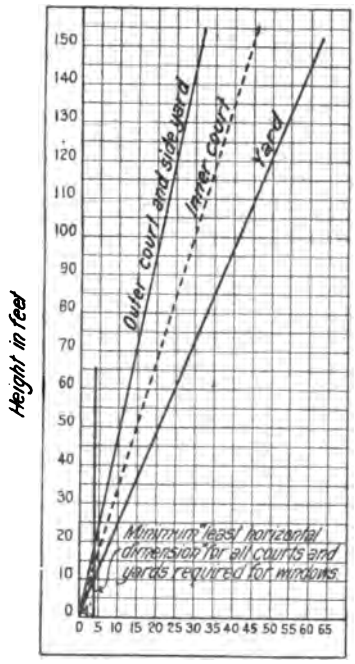


FIG. 164.

Area E District
Lots not over 50 ft. wide.
Least horizontal dimensions
of yards and courts.

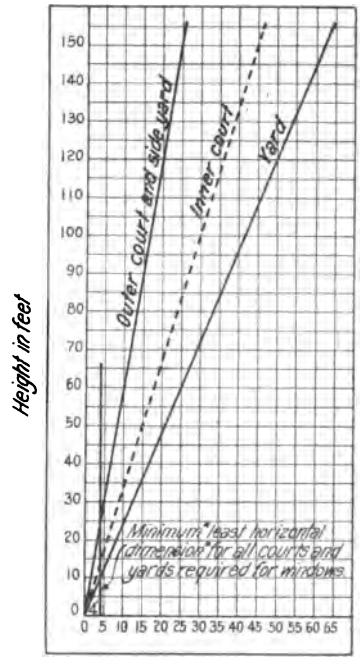


FIG. 165.

Area B District
Area C District
Area D District
Lots not more than 30 feet wide
Least horizontal dimensions
of outer courts.

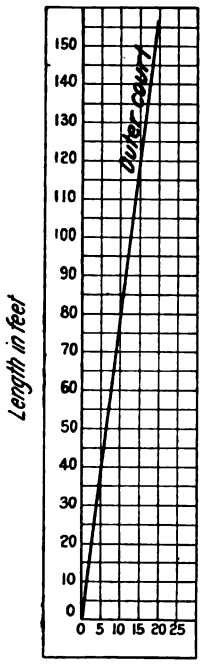


FIG. 166.

Area D District
Least horizontal dimensions
of outer courts.

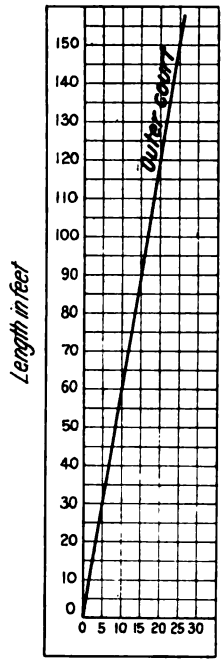


FIG. 167.

Area E District.
Least horizontal dimensions
of outer courts.

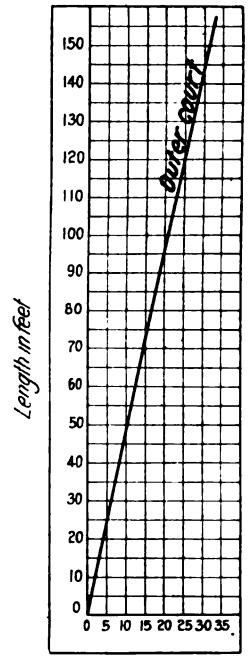


FIG. 168.

Area B District
Area C District
Area D District
(Non-residence district)
Least horizontal dimensions
of yards

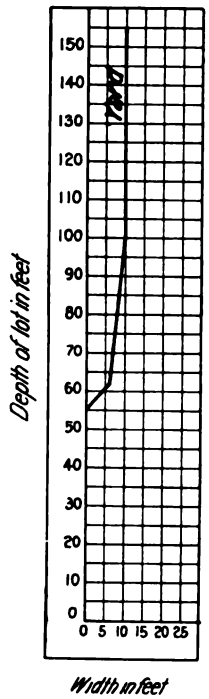


FIG. 169.

Area D District
Residence District.
Least horizontal dimensions
of yards.

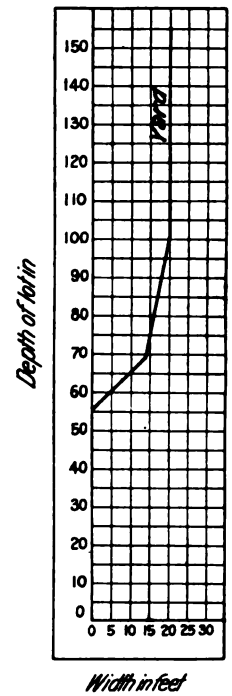


FIG. 170.

Area E District
Non-residence District.
Least horizontal dimensions
of yards.

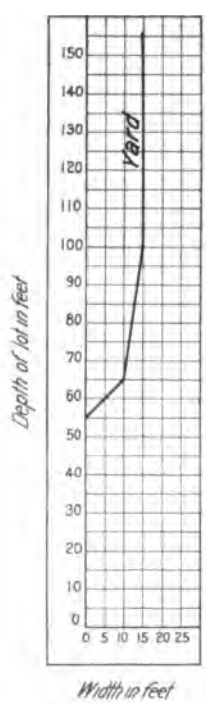


FIG. 171.

Area E District
Residence District.
Least horizontal dimensions
of yards.

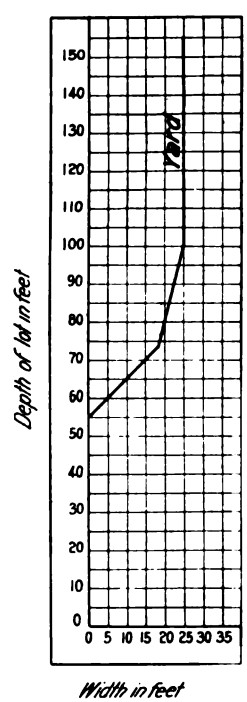


FIG. 172.

the square of the minimum depth of the rear yard as specified in terms of its ratio to the depth of the lot. This would mean that in B districts with a building 150 feet high, the depth of a rear yard would be 25 feet and the area of an inner court would be 25 by 25 feet, or 625 square feet, but such

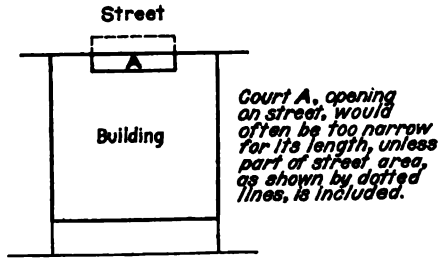


FIG. 173.

an inner court would not have to be square. It might be any shape provided that it were not more than twice as long as it were wide for such 625 square feet. After the first 625 square feet were satisfied, however, any additions might be made to the court as seemed desirable provided such additions conformed to the rules for outer courts or side yards or offsets as the case might be. A possible equivalent of a court 25 feet square would be one a little over 18 by 36 feet. In a corner apartment house 150 feet high, a rear inner court connecting with the street by a 10-foot side yard 50 feet long, would have to be 625 square feet but as the side yard is here 15 feet less than 65 feet long, 15 square feet for every 15 feet of height might be deducted therefrom. This, for a 150-foot building, would equal 15 by 10 feet or 150 square feet, which deducted from 625 would leave 475 square feet as the required area of the inner court, on the lot line. That would bring it down to 15½ by 31 as compared with 16 by 32 as required at the same height for inner courts on the lot line under the Tenement House Law.

Sec. 18, Par. (a). The provisions for skylights and projections beyond the walls of yards and courts follow the Building Code. A special exception within 5 feet back from a street wall is made so as to allow cornices or eaves to return their full width for architectural fitness.

Sec. 18, Par. (b). The provisions with regard to fire-escapes, fireproof ouside stairways and solid-floored balconies to fire towers follow in general the rulings of the Tenement House Department. As it is not desirable that fire-escapes, etc., should project 4 feet into an outer court no allowance for the same is made. In a rear yard, however, the requirements of other laws as to lattice enclosed fire-escapes demand a projection of at least 7 feet 8 inches. Therefore, 8 feet were allowed.

Sec. 18, Par. (c). A court corner might be cut off at an angle of 45 degrees, for example, and the length of the cut off might be as long as 7 feet, in conformity with the practice under the Tenement House Law. This would not affect the size of yards and courts but would affect the percentage of the lot that might be occupied.

Sec. 18, Par. (d). The requirement for offsets in yards or courts is intended to be virtually the same as it is in the Tenement House Law. Offsets could be shallower than they are wide but not deeper. It is not intended, however, that this clause shall be used to increase the length of outer courts.

Sec. 18, Par. (e). Where additions are made to an existing plan, even though they may be on separate lots adjacent on either side or to the rear, it is highly desirable that the whole plot should be considered as a unit in reckoning the distribution and sizes of yard and court spaces.

Sec. 18, Par. (f). If in a B district an existing building 150 feet high had a rear yard only 15 feet wide instead of 25 feet as herein required, the first additional 12-foot story would not have to set back 27 feet from the rear line, but only 17 feet and in the case of a stair or elevator, the rear wall could go up straight on the existing rear wall.

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